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Sound Patterns in Mandarin Recycling Repair

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Sound patterns in Mandarin recycling repair

Thesis directed by Professor Barbara A. Fox

The objective of the present research is to investigate the ways in which Mandarin interlocutors utilize prosodic resources as part of the means to achieve interactional actions and sequential-organization in natural conversation. By approaches of *interactional prosody* and *conversational phonetics* toward the analysis of sound realization of Mandarin repair in natural conversation, this study provides a preliminary exploration on how the combination of detailed prosodic features forms various sound patterns in reflecting the interactional aspect and sequential organization of Mandarin conversation.

The current study examines the particular example of recycling repair, defined as "a repeat of part of a conversational turn," among all methods used in accomplishing Mandarin same-turn self-repair. The data corpus consists of 260 cases of recycling repair culled from a collection of both video- and audio-taped naturally occurring Mandarin conversation. For each recycling, acoustic measurements, including duration, pitch, silence, cut-off and lengthening were carried out by using Praat. Additional judgments would be made based on the analyst's impressionistic interpretation of these acoustic cues. After taking measurements, the results were compared and the sound patterns that emerged from recyclings of the same sound manifestation were identified.

By a qualitative case-study methodology, this thesis reports 6 sound patterns and 3 sub-patterns based on 112 cases of Mandarin recyclings selected. The findings from the current research highlight the interaction-specific, sequence-specific, and function-specific examples of recyclings in relation to the use of the 6 main prosodic patterns. 3 sub-patterns that share some similarity with 2 of the 6 sound patterns in terms of interactional function were further identified. The result from the current exploratory work on the correlation between sound patterns in Mandarin recyclings and interaction contributes significantly to an interdisciplinary study that focuses on broadening the interactional linguistic theory by paying close attention to the sound patterns in natural conversation.

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This has been a long journey. I am at last able to express my sincere gratefulness to those who helped me throughout the process.

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I feel really fortunate that I don't find this an ending point of a long journey, but rather the beginning.

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Chapter 1 Introduction

The objective of the present research is to investigate the way in which Mandarin interlocutors utilize prosodic resources as part of the means to achieve interactional actions and sequential-organization in natural conversation. By taking approaches of *conversational phonetics* (cf. Kelly and Local 1989) and *interactional prosody* (cf. Couper-Kuhlen and Selting 1996), the current study focuses on how the *phonetic* and *prosodic* details in conversation help interlocutors to shape the talk, and how these prosodic cues form "sound patterns"[1] that facilitate interlocutors' understanding toward natural conversation. Following Ford and Couper-Kuhlen (2004), *phonetics* is used here as a superordinate term encompassing a broad array of sound patterns composed of prosodic cues, such as *duration*, *loudness*, *silence*, *pitch,* and *sound quality* (e.g. creakiness of voice). In the traditional linguistic analysis these sound features are considered "prosodic" or "suprasegmental", which are deemed to be "paralinguistic" and not core to the linguistics study. Although there have been detailed studies and a wealth of literature about how speech sounds are produced and combined into words and larger constituents, such as phrases or sentences, linguists still lack the basic knowledge about how interaction among speakers is manifested via detailed phonetic and prosodic features. It is only since the Eighties that conversational analysts started paying attention to the organization of phonetic details in relation to interactional action in natural conversation (cf. Couper-Kuhlen, 2001; Couper-Kuhlen and Selting, 1996; Couper-Kuhlen and Ford, 2004; Kelly and Local, 1989; Local, 1992; Local and Kelly, 1986; Local et al., 1986).

This thesis provides a preliminary exploration of the prosodic features of *same-turn self-repair* in Mandarin conversation. I choose to focus on self- repair over other types of repair (i.e. other-initiated repair), as self-repair occurs far more frequently than other-initiated repair in natural conversation (cf. Schegloff et al. 1977). For example, Schegloff et al. (1977) have shown the predominant preference of self-repair over other-initiated repair in the operation of repair in natural conversation. Specifically, the present study focuses on the particular example of *recycling repairs*[2] among all methods used in accomplishing same-turn self-repair in Mandarin conversation. By taking an *interactional* perspective toward the analysis of sound patterns of *recycling repairs* in Mandarin natural conversation, the objective of this study is to explore how the combination of detailed prosodic and phonetic features forms various sound patterns in reflecting important aspects of talk-in-interaction and the sequential organization of Mandarin conversation. Most of all, the current study attempts to address these major research questions:

- how interlocutors in Mandarin conversation make use of prosodic patterns on interaction-related devices, such as repairs, to reflect or project interactional function in conversation
- how the current study could advance our understanding of the interactional and sequential aspects of Mandarin natural conversation, especially on how prosodic patterns emergent from conversation contribute to carrying out and the interpretation of conversational actions and sequential organization

On the one side, this study incorporates an interdisciplinary approach of *interactional prosody* to the prosodic features in carrying out Mandarin recycling repairs, including pitch height, silence, duration, loudness, and repair initiators such as cut-off or sound stretch. This approach highlights the "integration of fine-grained analysis of sound patterns with fine-grained analysis of social actions" (Ford and Couper-Kuhlen 2004). On the other side, the eventual goal is to show that these phonetic and prosodic features pattern in conversation and are "designed for

the organization and management of talk in social interaction" (Couper-Kuhlen and Selting 1996: 25). As will be demonstrated, by examining "the interconnectedness of social action and sound patterns as documented in actual everyday use" (Ford and Couper-Kuhlen 2004), the study presents *interaction-specific*, *sequence-specific*, and *function-specific* examples of recyclings in correlation with the use of particular prosodic patterns. The goal is to show that sound patterns in conversation are "designed for the organization and management of talk in social interaction" (Couper-Kuhlen and Selting 1996: 25).

This chapter is divided as follows. Section 1.1 provides a description of same-turn recycling repair in Mandarin conversation. A preview of the main findings is presented in Section 1.2. Section 1.3 describes the organization of the thesis.

1.1 Same-turn recycling repair in Mandarin conversation

To explore the correlation between sound patterns and their interactional function in natural conversation, the current study focuses on the sound realization of *same-turn self-repair* in Mandarin conversation. The main goal is to investigate how sound patterns identified from same-turn self repair reflect aspects of interaction in and the sequential organization of Mandarin conversation. Specifically, for the present work I choose to examine sound patterns realized in Mandarin *recycling repair*, defined as "a brief, sometimes a longer repeat or re-saying of part of the utterance occurring in a conversational turn," following Schegloff (1987: 71). One of the recycling repair examples is provided in the following:

(1) AU-013-Sgr-022

1.	Y:	ni[3]	shenme	shihou	mai	de		
		2sg	what	time	buy	Nom		
2.	E:	zai	Taiwan	mai	de			
		Prep	Taiwan	buy	Nom			
3.	Y:	oh:::						
→ 4.	E:	ta	na shihou	**mai-**	**mai**	zhege	song	ipod
		3sg	that time	buy	buy	this-cl	give	PN

Y: 'When did you buy (it)?' ((referring to E's laptop))
E: '(It was) bought in Taiwan.'
Y: 'oh:::'
E: '(At) that time, it was **buying- buying** this one getting one IPod free.'

In line 1 of the conversation, Y starts the turn with a question to E about where E bought the laptop. E in line 2 answers the question in the *second pair part*, and Y fellows up with the stretched reactive token 'oh' to show the reception of the answer. Moving on to line 4, E provides additional information about buying the laptop. When she finishes the verb *mai* 'to buy', there is a cut-off (marked by the transcription convention of a dash line "-") at the end of the verb, followed by a direct repetition of the same word. Here speaker E carries out the *recycling repair*, by an immediate *repairing* of part of the turn-so-far (cf. Schegloff et al. 1977).

There are several reasons I chose this particular method of carrying out same-turn recycling repair as the main focus of the integrated study on sound and interaction: first of all, the phenomenon of repair is commonly found in spontaneous speech and has been discussed extensively within the field of interactional linguistics and conversation analysis (e.g. Jasperson, 1998; Sacks et al., 1974; Schegloff, 1979; 1987). Based on previous studies, prosodic features including cut-offs, pauses, filled pauses, and sound stretches all play a crucial role in the realization of self-repair in natural conversation. Thus the choice of concentrating on the prosodic realization of self-repair in Mandarin conversation carries two-fold implications in that, on the one hand, the study attempts to uncover how prosodic patterns are employed in

accomplishing Mandarin self-repair, while on the other, repair functions as an important interactional device. By focusing on prosodic features in the use of repair, the current study may reveal how prosody contributes to conversational interaction. Eventually, one of the goals of the present study is to further our understanding of the relationship between prosody and interaction, especially on how sound patterns in Mandarin conversation are employed for interaction and to reflect and shape the structure of conversation.

Secondly, there are several reasons to choose *recycling* repair as the central focus of this study. First of all, as shown in some past quantitative studies on Mandarin repair (cf. Chui, 1996; Tseng, 2003; 2006), this type of *repetition repair* is the most frequent type of repair in Mandarin conversation[4]. Although there has been at least one past study discussing the prosodic realization of repairs in Mandarin speech (cf. Tseng 2006), no work to my knowledge has attempted to explore the sound patterns of Mandarin repair from an interactional perspective. Furthermore, I have chosen *recycling* repair mostly because it is realized in the conversation as a type of repetition, which makes it an easily identifiable construction. Another recent cross-linguistic study investigating the site of initiation in same-turn self-repair by Fox et al. (2009) also suggests that Mandarin speakers consistently initiate repair after the word is recognizably completed. Most of all, the preference of initiating Mandarin repair after recognizable completion provides us a sound justification to compare the sound realization of repeated words or phrases in doing recycling repair: since the recycling would be the complete repetition of the same word or phrase of the turn-so-far, it actually allows for a simple comparison of the sound realization of the repeated words.

The study employs a qualitative case-study methodology inherited from principles of interactional linguistics. An initial corpus consisted of approximately 260 cases of recycling repair culled from both video-taped and audio-taped face-to-face Mandarin conversation was prepared. After taking acoustic measurements, and excluding examples that occurred at overlapping turns or with background noises, 143 instances of recyclings were selected and categorized on the bases of the sound realizations, i.e. in a shared sound pattern. In the current study, the sound patterns that emerged from recyclings consist of various acoustic cues, including *duration*, *loudness*, *silence*, *pitch*, *cut-off*, and *sound stretch*. These sound patterns served as representations of "forms" in pursuing the interconnectedness between form and interactional function corresponding to the recyclings. The result of this exploratory analysis is specifications of 6 sound patterns over 112 examples of recycling repair. Each sound pattern was identified to correspond to a distinct interactional function. The residual cases of recyclings were realized in possible sound patterns but there were not enough instances of recyclings to draw a concrete conclusion for the possible corresponding interactional function. Additional companion cases will be required to provide further analysis.

In the next section, a preview of the main findings will be provided.

1.2 Preview of the main finding and significance

The current study is significant in several ways. Most of all, as the results of preliminarily exploring how Mandarin speakers utilize sound patterns while doing Mandarin repair, at least 6 sound patterns as combinations of various sound cues have been identified. Each pattern was found in recyclings that were either located at sequentially-sensitive positions within the turns,

doing specific actions or carrying functions for interactional purposes. From the perspective of sound realizations, the present study bears the significance in demonstrating that more than one sound pattern has been identified in doing Mandarin repairs for the purpose of interaction among interlocutors. Thus this study differs from the previous study on the prosody of Mandarin repairs (cf. Tseng 2006) in that the main focus is not to identify the "marked" prosodic pattern for doing Mandarin repairs, but to uncover the possible sound patterns used in recycling repairs for specific interactional functions. No past study on Mandarin repairs has approached the sound realizations in Mandarin recyclings from an interactional perspective.

As an overview to the findings from the current study, I summarize in Table 1-1 below the 6 sound patterns identified in doing Mandarin recyclings for specific interactional functions. The Table is organized by the sound features incorporated in composing the major sound patterns identified from Mandarin recyclings[5]. The first sound cue is the relative *length* between the first mention, or the *repairable* segment (R1) and the repeated mention, the *repairing* segment (R2) of the recycling. The second cue is the relative pitch height between the repairable and repairing segments of the recycling. The third cue is if the repair is initiated by cut-off or lengthening. The fourth cue is if there is any significant pause in between the repairable and repairing segments. Some other sound features include if there is a falling pitch contour at the end of the repairable segment of the recycling, and if the louder repairable or repairing segment has been detected.

Pattern and Functions	Sound Features				
	(a) Length	(b) Pitch	(c) Repair initiation	(d) Silence	(e) Others
Pattern 1- *projecting a continuation of TCU*					
	Longer R1	R1 & R2 Same pitch level	Cut-off		
Pattern 2- *projecting a semantic contrast*					
	Longer R1	Higher R2	Cut-off		
Pattern 3- *Word or content search; holding the turn in delicate situation* (with two sub-patterns)					
	Longer R1	Higher R2	Lengthening	Yes and No	May have fall-to-low ending in R1
Pattern 4 - *Restarting of the TCU after production problem* (with one sub-pattern)					
	Longer R1	Higher R1	Lengthening or Cut-off		
Pattern 5- *Recycling at turns of dispreferred actions*					
	Longer R1	R2 within the Range of R1	Lengthening or Cut-off		
Pattern 6- *Getting back to the turn after clarification-seeking actions*					
	Longer R2	Louder R2	Cut-off		Louder R2

Table 1-1. Compositions of the sound patterns and the corresponding interactional functions

The sound features presented in Table 1-1 are the key sound cues composing each sound pattern identified in carrying out Mandarin recycling repairs. It should be noted, however, that these sound features were not necessarily taken as distinctive features defining one sound pattern from the other, nor were all of them the required features in composing each sound pattern. Rather, each sound pattern emerged from the actual sound realization of recyclings in natural Mandarin conversations. The major sound patterns were distinguished from one another, based on the distinctive *interactional function* correlated with the recyclings in a sound Pattern. As results, six sound patterns and three sub-patterns were identified and each pattern corresponded to a unique interactional function while doing the recycling repairs. The current study focuses on exploring preliminarily how the sound patterns identified reinforce the functional aspects of the recyclings. The major findings are previewed below.

First of all, two of the distinctive sound patterns identified involve the function of *projecting forward* a continuation of the turn-so-far, or a semantic contrast, namely pattern 1 and pattern 2 respectively. While both sound patterns are realized with longer repairable segments, pattern 1 functions to project a *continuation* of the turn-so-far, which is reflected mainly in that R1 and R2 of the recycling are realized at the same pitch level. Another finding regarding pattern 1 is that the recyclings in this sound pattern tend to occur at turn-beginning positions, sometimes after the turn-initial connectives or conjunctions, and in most of the cases involve repetitions of Mandarin personal pronouns. On the other hand, sound pattern 2 carries the function to project *a semantic contrast*. With pattern 2, interlocutors may utilize a higher pitch height on the R2 to emphasize a change from talking about one person to another, or from one action to another, for the purpose of making contrast. Compared to sound pattern 1, recycling examples in pattern 2 tend to occur later on in the turn.

One of the uses of repair in conversation is when speakers encounter problems during the process of production. For instance, the troubles of speaking may arise when the speakers cannot locate the exact word they want (Sidnell 2010). In this case, the repair is incorporated to "delay the next item due". The current study provides some insights to the sound realization of the recyclings that serves the functions of delaying the next item or next bit of conversation. Pattern 3 emerged from recyclings involving the function of *word* or *content* search. This specific function is reflected in the sound combination of a lengthened R1 with a falling to low ending, followed by a significant pause, then the R2 at a higher pitch height. It was found that when Mandarin speakers recycle part of the turn for word or content search, they might choose specific lexical items or expressions, such as the demonstrative pronoun *nage* or the expression *jiushi* for the *place holder* or *floor holder* function. Moreover, the same sound pattern but without a fall-to-law pitch contour at the end of the R1 is identified as a sub-pattern that is for the function such as recycling the turn for a delicate situation.

While repair can occur to hold the turn for gaining more time to do word or content search, in the current study it is further found that when encountering production problems in the turn, especially after series of instances of repair, speakers may choose to recycle the turn again to *restart* the turn. It is suggested that recyclings in pattern 4 with a longer and higher R1 carry this *restarting* function, as the longer R1 at a higher pitch level may stress the action of restarting the turn. Patterns 5 and 6 both involve recyclings located at turns of unique sequential locations. Recyclings in pattern 5 occur in the turns of various *dispreferred actions*, i.e. rejection or delayed acceptance to an invitation or offer, or disaligned actions. The sound features of recycling the turns for dispreferred actions include a longer R1, followed by a rushed-through R2, in which the

faster speech rate results in less variation of the pitch contour. Finally for pattern 6, it is found in recyclings located at turns that are after other sequences, i.e. adjacency pairs or other-initiated repair seeking clarification or confirmation. The shorter R1 was resulted from a jump start from the word prior to R1, while the longer, higher, and louder R2 could be related to the speaker's attempt to secure the turn after the previous interruptive sequences in turn-taking.

So far the correlation between the sound patterns identified for doing Mandarin recycling repair and the interactional functions has been described as a one-to-one mapping relationship. One point to note, however, is that this does not necessarily imply that the relationship between the sound pattern as a form and the correlated interaction function must be a one-to-one mapping. As the current study provides only an initial exploration of the possible interactional function corresponding to sound patterns as combinations of various acoustic cues while doing recycling, the result presented in the thesis is rather preliminary. In other words, I do not intend for the result here to project a strong claim that the function correlated with each sound pattern (and sub-patterns) must be exclusively for that sound pattern only. Moreover, due to that each sound pattern is described as constellations of selected prosodic cues, it should also be acknowledged that it is possible the interactional function identified for one sound pattern could be associated with one of the sound features in that sound format. As the result of shared acoustic features, some of the interactional functions may seem to be in overlap.

Some additional notes based on the current findings are that, for one, although the current study focuses on the sound realization in terms of interactional function while doing Mandarin recycling repair, it should be stressed that sound is treated as one of the many factors contributing to the interpretation of talk-in-interaction. It is recognized that, while carrying out

repair, in addition to the sound realization, other factors such as the meaning of the word or phrase involved in the repair, the contextual cues in the interaction, or even the visual cues such as gestures or eye gaze all contribute to the interpretation of actions in conversation. Some good examples are that, as will be shown, some of the sound patterns identified are found in recyclings that involve repetitions of lexical items with specific grammatical functions, i.e. Mandarin demonstrative pronouns; or words that have undergone grammaticalization and are used with special discourse function, i.e. the word *jiushi* in Mandarin. While in the discussion it is suggested the sound realizations in the recyclings involving these lexical items may be correlated with certain aspects of interaction, the meaning and function of the words also contribute at the same time to the interpretation of the action. Eventually the interactional function of repair would be reflected on different level of representations, not limited to the sound manifestation, but also the semantics, pragmatic interpretation, as well as additional visual cues accompany the repair. As will be seen, one of the directions of future study is that the findings from current study do point to such *multimodality* analysis of language as embodiment of interactively constructed social actions[6].

1.3 Organization of the thesis

The thesis consists of six chapters. Chapter 2 provides a review of the theoretical background and relevant research. Chapter 3 presents the data and describes the methodology employed in analyzing the sound patterns of Mandarin same-turn recycling repair.

Chapters 4 and 5 describe the 6 sound patterns identified in doing Mandarin recyclings. Chapter 4 focuses on recyclings that are realized in the longer R1. Together there are 5 sound

patterns in favor of having a longer R1, or relatively shorter R2. The discussion concentrates on how the sound feature of length combines with other sound cues, including pitch height, cut-off or lengthening, and silence to form sound patterns for specific interactional function or sequential environment in the execution of recycling repair. Chapter 5 specifies one more sound pattern featuring the sound cue of shorter R1, or relatively longer R2 in combination with other sound cues and the possible interactional function correlated with the pattern.

Chapter 6 concludes the study by summarizing the main findings. Implications of the current study and directions for future research are provided.

Appendix A provides a guide of transcription conventions incorporated in the transcripts. Appendix B lists the abbreviations of terminology for marking grammatical categories in the Mandarin conversational data.

[1] Here "sound pattern" refers to sound formats as combinations of various prosodic cues in the execution of Mandarin recycling repair. In this dissertation I use the term "sound pattern" instead of "prosodic pattern" in referring the prosodic realization of doing Mandarin recyclings, as it is inspired by the book *Sound patterns in interaction* edited by Couper-Kuhlen and Ford (2004). The book is a collection of works and research examining conversational interaction by the approach of *interactional prosody* or *conversational phonology*, focusing on different aspects of prosodic and acoustic realization of talk-in-interaction. As introduced in the introduction chapter of the volume, the approach of *conversational phonology* advocated by Kelly and Local (1989) emphasizes on taking an "impressionistic" view and pays attention to every phonetic detail presented in the talk-in-interaction, including properties such as pitch, loudness, tempo, syllable rhythm and phonatory settings, as well as the variability and co-occurrences of these properties (Ford and Couper-Kuhlen 2004: 12). To carry out functional analysis, the approach focuses on looking for "sound patterns" in relation to actions in interaction. Following the *conversational phonology* approach, the studies presented in the volume examine a large selection of phonetic and prosodic parameters, including pitch contour and height, voice quality, phonatory setting, loudness, in terms of interaction (Ford and Couper-Kuhlen 2004).

In the current study, although I choose to focus on a limited set of prosodic cues in doing Mandarin recycling repair, it doesn't imply that these prosodic cues are the only possible acoustic features that can contribute to the interpretation of interactional function in doing recycling repair. Thus I choose the term "sound pattern" rather than "prosodic pattern", in that the former terminology may encompass a wider range of possible aspects of the sound realization in doing repair for the purpose of talk-in-interaction.

[2] For a description of same-turn *recycling repair*, please refer to Section 1.1.

[3] All transcripts in the present study were transcribed, following the conventions of the transcription system developed by Gail Jefferson (cf. Sacks et al., 1974; Ochs et al., 1996). The detailed notation conventions employed in the transcription are provided in Appendix A. As for a description of the data used in the present study, please refer to Chapter 3.

[4] For a detailed review on the past studies of Mandarin repairs, please refer to Section 2.3 in Chapter 2.

[5]Note here that there are additional *sub-patterns* identified to 2 of the 6 sound patterns, namely patterns 3, and 4. The relationship between main patterns and *sub-patterns* are decided based on the similarity in the interactional function corresponding to the pattern and sub-pattern(s). For a more detailed definition, please refer to Section 3.3, Chapter 3. In Table 1-1 I merge the sub-patterns with the main patterns identified.

[6] For more elaboration on this point, please refer to Section 6.2.3, Chapter 6.

Chapter 2 Theoretical background and research review

Repair is a commonly occurring phenomenon in human speech. In the process of conversational exchange, speakers often stop before the end of their turns to make adjustments, i.e. to correct, to elaborate, or to qualify what they have said (Jasperson 1998). Such *same-turn* self-repair has been the focus of studies in the relevant fields, including psycholinguistics (e.g. Levelt, 1989; Levelt and Cutler, 1983), computational linguistics (e.g. on disfluency in speech: Bear et al., 1992; O'Shaughnessy, 1983; Shriberg, 1994; 1995; Tseng, 2003; 2006), general linguistics (e.g. Chui, 1996; Couper-Kuhlen, 1992; Fox and Jasperson, 1995; Fox et al., 1996; Local, 1992, Fox et al. 2009), and most of all, in Conversation Analysis (e.g. Jasperson, 1998; Schegloff, 1979; 1987; Schegloff et al., 1977).

This chapter provides theoretical background to the research approach employed in the current study, as well as reviews relevant studies on repairs in natural conversation from different theoretical perspectives. The chapter is organized by the aforementioned approaches. First of all, there will be reviews on previous studies about *same-turn recycling repairs*, emphasizing the prosodic realization or prosodic features of this specific type of repair. Section 2.2 introduces briefly the study of repairs (or disfluency) in psycholinguistics and computational linguistics. Section 2.3 focuses on the discussion of repairs in Mandarin conversation. Section 2.4 presents the background of the research procedure for the current study, namely *conversational phonology* (cf. Kelly and Local 1989) and *interactional prosody* (cf. Couper-Kuhlen and Selting 1996), which take an "impressionistic" analysis together with acoustic measurements towards the prosodic and phonetic details of naturally occurring conversation. Section 2.5 is the chapter summary.

2.1 Studies of same-turn self-repair in English conversation

One of the earliest significant works on same-turn self-repair is the study on *error correction* in English conversation by Jefferson (1974). In this study, Jefferson proposes the **Error Correction Format** (hence ECF), which is a device available to speakers in conversation to display error corrections (1974). Jefferson explains that the ECF consists of these components:

[$WORD_1$+HESITATION+$WORD_2$] (1974: 186)

In this format, $WORD_1$ represents the part of the conversation that is an error. The error is usually followed by some kind of hesitation and then a $WORD_2$ as a correction to that error (Jefferson 1974). According to Jefferson, this format can capture certain orderly features of speech forms that serve as a resource for interaction (1974). In the actual realization, the error (or $WORD_1$) could be a word that is fully verbalized, partially verbalized, or merely projected (Jefferson 1974: 185). The HESITATION in the format could be realized as a cut-off marker, a pre-correction interjection like 'UH', or a pause (Jefferson 1974: 187). The following examples are taken from Jefferson's study to illustrate how ECF works:

(1)
1. Louise: A twelve-year-old guy comes over I say whose **y- older** brother is he?
(1974: 185)

(2)
1. Desk: He was here **lay- uh earlier**, but 'e left. (1974: 185)

(3)
1. Louise: My father's six foot two feet he's *large* an' he's a very **s-**
2. Ken: ehheh
(1.0)
3. Ken: 'St(hh)able *per* son' yea(h)h.
Sta- mm hm,
(1.0)
4. Louise: Stable or not, he's uh (1.0) aggressive kind of person,
(1974: 186)

In (1), the ECF is realized with a partially verbalized word plus the cut-off (shown by the dash "-") as HESITATION. The correction is then uttered as 'older', possibly replacing the erroneous 'young', which is verbalized partially. Similarly, in (2) the ECF consists of the partial realization of $WORD_1$, the cut-off at the end of $WORD_1$ with the interjection 'uh' as HESITATION, and 'earlier' as $WORD_2$ of correction. In (3) Louise has another partially verbalized word with cut-off at the end of line 1. Instead of correcting $WORD_1$, the cut-off marker is followed by a long pause. The other speaker thus takes over the turn in line 3 and helps to finish the word. Here Jefferson suggests that the next speaker's proposal of the word 'stable' is responsive to the cut-off after the partially verbalized word (1974). As Louise starts line 4 with 'stable or not', which implies that the current speaker does not necessarily approve the other speaker's interpretation of the 's-' in line 1 as being correct. Therefore ECF does not necessarily involve correction on an error. In this case, the HESITATION in the ECF is realized in actual conversation as [cut-off + pause] (Jefferson 1974).

Schegloff, Jefferson and Sacks' 1977 study (hence SJS) on repair in English conversation is another pioneer research of repair in the field of Conversation Analysis. Instead of using the term "correction", SJS use "repair" to capture not only corrections in conversation, but other possible replacements or word searching in general, whether errors/corrections are involved or not. Their discussion of repair focuses on the organization of repair. Repair in conversation has been categorized into "self-repair" and "other-repair", as these are the two classes of participants categorizing the major sequential interaction in conversation (Schegloff et al. 1977). SJS further suggest that the INITIATION and OUTCOME of a repair can be quite distinct, as the one who accomplishes a repair is not necessarily the one who initiated the repair (1977). In discussing the

INITIATION of repair, SJS further categorize the INITIATION in into *self-initiations* and *other-initiations*. It is claimed that self- and other-initiations have different placements in terms of conversational structures and initiation techniques (Schegloff et al. 1977). Most of all, it is found that self-initiations within the same turn use a variety of non-lexical speech perturbations, including cut-offs, sound stretches, filled pauses such as 'uh' (Schegloff et al. 1977). These sounds function to signal the possibility of repair-initiation that follows immediately.

Schegloff (1979) in a later study on the relevance of English repair to syntax-for-conversation also makes similar remark about the initiation of repair in the same conversation turn. It is claimed that the initiation of same-turn repair takes a limited number of forms that are sensitive to the most immediate sound environment of their production (Schegloff 1979). One of the common forms is the CUT-OFF used within a word or a sound (Schegloff 1979: 272). When repair is initiated outside the boundary of a word or sound, a pause or filler '*uh*' are commonly used as repair initiators (Schegloff 1979: 272-273). Since a cut-off stops a word from completion, the cut-off initiated repair is generally considered *postpositioned* (Schegloff 1979: 273). On the other hand, the '*uh*' and pause occupy the position of the next-due element and are thus considered *prepositioned* (Schegloff 1979: 273).

One of the studies on same-turn self-repair that could shed light on the current study is Schegloff's paper on *recycled turn beginnings*. In this study, Schegloff examines *recyclings* that occur at the beginnings of speaking turns. The *recycling* refers to "a brief, sometimes a longer repeat or re-saying of part of the utterance occurring in a conversational turn" (Schegloff 1987: 71). In the initial observation, it is suggested that one place that these recyclings regularly occur is at *turn beginnings* (Schegloff 1987). Schegloff further explains why turn beginnings are

important resources for the sequential organization in conversation. For one, turn beginnings are an important initial place for the projection of the turn-shape or the turn-type, and this projection in turn plays a critical role in the sequential organization and turn-taking system in conversation (Schegloff 1987: 71). Although interlocutors in conversation would work out the fine coordination of the turn-taking system by minimizing gaps and overlaps between speaking turns, it still cannot be avoided when speakers overlap in talk and impair the perception of on going conversation. Actually, turn beginnings are vulnerable to impairments by overlaps, especially when an intending next speaker aims for an earliest possible start and when the current speaker adds on further post-completion elements to the current turn (Schegloff 1987). It has been observed that, when there has been an overlap at the turn beginning with the prior turn, the speaker of the next turn regularly makes use of identical repeats, i.e. *recyclings* at the turn beginning of the next turn (Schegloff 1987). Also, on the occasion of overlap, the next speaker would co-construct the on-going conversation with the current speaker, so that the recycling begins precisely at the point where the overlap just reaches an end (Schegloff 1987). Thus the "new" turn emerges and will have a clear projection.

Another finding from Schegloff's discussion on recycled turn beginnings is about the *pre-placed appositionals* as a type of system resource dealing with the possible turn-beginning impairment (1987). According to Schegloff, the pre-placed appositionals refer to the English conjunctions or discourse markers such as 'well', 'but', 'so', 'yeah', and 'y'know' (1987: 74). It is suggested that, in cases of the co-occurrence of pre-placed appositionals plus the recyclings at the turn-beginning positions, when the appositionals function to "absorb" the impairment as a result of an overlap in between the transition of turn-taking, the pre-placed appositionals are usually left out of the recycling (Schegloff 1987). Sometimes the pre-placed appositionals may

carry the dual functions to absorb the overlap and at the same time to serve as sequential markers.

Following Jefferson (1974), Schegloff (1979), and other previous studies on same-turn repairs (i.e. Fox and Jasperson, 1995; Local, 1992), Jasperson (1998) provides a detailed descriptive analysis of English same-turn repair initiated by cut-off. Specifically, in this study Jasperson concentrates on examples of "focused repair after cut-off, of the turn constructional unit-so-far" (1998: 2). The "cut-off" is defined as "an articulatory closure that interrupts the airstream" (Jasperson 1998: 2). For English repair, it is commonly initiated by such cut-off. After the cut-off initiator, the repair will change an already-spoken element of the conversational turn in progress. By taking a qualitative case-study methodology, Jasperson explores focused repair in terms of the "form" of repair, i.e. "methods" of doing repair in conversation, and the corresponding semantic and pragmatic function paired with the form (1998). In the main findings of Jasperson's study, 13 methods of carrying out focused repair are identified. These repair methods are divided into 3 groups: replacement, insertion, and recycling with change, based on the general function of the focused repairs[1] (Jasperson 1998). Jasperson further specifies three key features of methods to categorize instances of focused repair within each group: a) cut-off position within a word, b) significant pause, or c) specialized pitch configuration (1998: 8). In this case, all these key features in one way or the other involve the prosodic realization of focused repairs.

Among the 3 groups of the 13 methods of doing focused repairs, Jasperson explains the group "recycling with change" as "repair-related lexical repetition" (1998: 8). Of the 5 methods used in this group, at least one method is related to changes in prosody of the recycling[2].

Following is one of the examples given by Jasperson to explain focused repair initiated by a cut-off and a recycling with change in prosody:

(4)

1.	G:	There's twi:ns that-	← cut-off
2.		(0.8) t<u>wi:</u>ns that-	← resumption recycles twins, changes its accent
3.		live over there,	

(1998: 314)

In this example, the repair is initiated by a cut-off at the end of the lexical item *that*. The cut-off is followed by a significant pause, and then the turn is resumed with a recycling of part of the turn-so-far. The recycling of 'twins that' is a direct repetition without lexical change. But one of the recycled words, *twins*, is accented differently from its initial utterance in line 1 (as differentiated by the underlined part in line 2). Jasperson suggests that this change in prosody is viewed as the focus of *repair operation* (1998: 314). **Repair of prosody** refers to "a range of prosodic features that can be added or replaced by recycling a word or phrase that could host the prosodic features" (Jasperson 1998: 315). Jasperson further proposes the following "format" to specify the formal prosodic elements included in the repairing prosody:

<u>Prosody Repair</u>
[cut-off]±[delay]+[recycled lexical material, new prosody] (1998: 322)

According to the study, the initiating [cut-off] of prosody repair is relatively unrestricted with respect to its position within a word; the cut-off could be located at either word-initial, word-medial, or word-offset position (Jasperson 1998). After cut-offs, there may or may not be a delay (Jasperson 1998). The resumptive component of the repair segment is specified as "recycled lexical material", which could be realized in at least four of these prosodic elements: *replacing accent*, *changing volume*, *changing pitch range*, and *shifting accent* (Jasperson 1998).

Jasperson also indicates that some of the consequences of prosody repair could go beyond a mere change in prosody and reflect further semantic or syntactic consequences of the repair (1998).

In summary, these previous studies on same-turn self-repair in English conversation provide us with some insight of how the repairs are initiated prosodically. For English same–turn self-repair, one of the cues to initiate the repair is the articulatory closure of a cut-off at any position within a word or phrase that involves in the repair. When turning to the sound realization of our Mandarin recycling examples, I also take cut-offs into consideration and examine how cut-off operates as repair initiator. In addition to cut-off, I pay attention to other sound representations used in initiating Mandarin recyclings, such as sound stretches. Most of all, as the current study focuses on exploring the prosodic realization of Mandarin recycling repair and the interactional function correlated with the various sound patterns, it is of our main interest to identify the possible "prosody for Mandarin repairs" consisted of different prosodic features, including cut-off and sound stretch.

One extra point to make here is that, as will be seen, at least one major sound pattern identified in the current study occurs frequently in recyclings at turn-beginning positions. The finding here is quite similar to the English recycled turn beginning suggested by Schegloff (1987). Moreover, it is found that the recyclings in at least one specific sound pattern also follow the Mandarin conjunction or discourse marker at the turn beginning positions, but the conjunction or discourse marker is left out of the scope of the recycling. So I will explore further if these recyclings at turn beginning positions carry specific interactional functions in Mandarin conversation, and the relationship between these recyclings and turn-initial appositionals.

2.2 Studies of repair in psycholinguistics and computational linguistics

Some of the previous studies on repair have adopted the approach of either psycholinguistics or computational linguistics. Sometimes also discussed under "self-correction" or "disfluency", most of these studies on repair in psycholinguistics or computational linguistics employed the methodology of statistical analysis, and the data of these studies are mostly elicited from controlled experiments or specifically designed tasks. In this section I briefly summarize studies focusing on repair, especially the prosody of repair.

Cutler (1983) discusses the prosodic aspects of spontaneous self-corrections. In this study, Cutler distinguishes between *prosodically marked* repairs and *unmarked* ones (1983). An unmarked correction is identified as having "as far as possible, the same pitch as the original error" (Cutler 1983: 80). In addition to pitch, features such as amplitude and relative duration are also similar in an unmarked correction and its trouble source (Cutler 1983). On the other hand, a correction is marked "when prosodic features of the repair and the error differ" (Cutler 1983: 81). Cutler further suggests that the markedness is reflected in either a noticeable increase or decrease in pitch, in amplitude or in relative duration; it is not necessarily the case that high-pitched correction is marked (1983). Based on the categorization of markedness and unmarkedness of prosodic realization of corrections, Cutler's experiments show that corrections of phonetic errors, i.e. errors involving single phonetic segments, tend to be unmarked, and only lexical errors are frequently marked (1983).

Levelt and Cutler (1983) extend Cutler's study and compare the prosodic markedness of both the syntactic and semantic characteristics of repairs. Their analysis shows that prosodic marking has no relationship with the syntactic characteristics of repairs (Levelt and Cutler 1983). But

marking is shown to be associated with semantic factors; most of all, corrections for errors tend to be marked prosodically while corrections for appropriateness are less likely to be marked (Levelt and Cutler 1983). Levelt and Cutler thus conclude that prosodic marking of repairs is equivalent to accenting in assigning the prosodic prominence of part of an utterance, and the placement of accent functions to reflect the semantic structure of the utterance (1983).

One of the studies that bear implications for the methodology adopted in the current research is the study on the phonetic correlates of self-repair involving word repetitions in German speech by Benkenstein and Simpson (2003). In their study, Benkenstein and Simpson provide detailed phonetic descriptions of the sound realization in self-repair sequences involving the repetition of words in German speech, using the approach of both impressionistic auditory and acoustic records (2003). Specifically, they compare the phonetic differences between *reparandum* and *repair tokens* and identify a number of different patterns around cut-offs in the repair. In the findings, it is suggested that the vast majority of cases directly adjacent to cut-offs in the subset of German repair sequences belongs to the class of function words (Benkenstein and Simpson 2003: 82). They also present three different types of repair sequences based on bundles of phonetic features located around the cut-offs, including the *lax* type that has a long final vocalic or consonantal portion at cut-offs, the *tense* type with cut-offs initiated by glottal closure, and a third type when the repair followed directly on from the reparandum without any break or change in phonation or pitch (Benkenstein and Simpson 2003).

Shriberg (1995) investigates the acoustic properties of English disfluent repetitions by taking a computational linguistics approach. Following the study by Heike (1981) on functions of repeating, Shriberg classifies English instances of repetitions into two types: *prospective* and

retrospective (1995). The *prospective* repeats have a pause after the repeated part (R2) and before the continuation, while *retrospective* repeats don't. The main functional difference between the two types of repeats is that, on the one hand, *prospective* repeats are used with a *stalling* function, which serves the purpose of holding the floor during *hesitation* (Shriberg 1995). On the other hand, *retrospective* repeats serve as bridging devices "to connect a continuation with preceding material after a break in fluency" (Shriberg 1995: 384). The acoustic analysis further shows that *retrospective* repeats tend to have longer R1 and both R1 and R2 have a falling F0, while *prospective* repeats may have a lengthened R2, and a fall in the F0 of R2 from the F0 at the offset of R1 (Shriberg 1995). Thus it is claimed that these findings on acoustic properties of English disfluent repetitions supports Heike's proposed functions for types of English repeats (Shriberg 1995).

One point to address here is that, in terms of methodology, the type of data being examined in these studies is taken mostly from texts performed during specific tasks, or designed for specific experimental purposes. As result, these studies may not tell us much about the interactional functions reflected in the sound realization of repairs in natural conversation. Even though the study of English disfluency by Shriberg does bring up the functional side of the repetition, it is also claimed in her study that "the terms *retrospective* and *prospective* are simply for classification of repetition based on its surface pause feature" (1995: 384). The current study emphasizes more the interactional functions correlated with the sound patterns identified in doing Mandarin recycling repair. It is held that prosody is used as one of the resources for interlocutors in natural conversation to achieve interactional actions. By examining the prosodic realization of recyclings, the current study attempts to uncover how prosodic cues used in the realization of Mandarin repairs contribute to the specific interactional function of repair; my

study is not limited to the sound cue of pause only, but also includes other cues such as cut-off, sound stretches, pitch height and duration. In particularly, one of the goals is to uncover how the combination of these sound cues forms specific sound patterns for Mandarin recycling repair. The study focuses in detail on why the interlocutors use, for example, sound stretch with a fall-to-low pitch followed by a pause for the function of word search; or why the speakers hold the pitch height across the repetitions in the recycling for the function of continuing with the turn-so-far[3].

Finally, as for methodology, the present study incorporates both the acoustic measurements and impressionistic approach to the prosodic realization in Mandarin recyclings[4]. This is actually quite similar to Benkenstein and Simpson's study of German word repetitions mentioned above. The current study differs from theirs in that, for one, though they claim that the examples of self-repair involving word repetitions are extracted from German spontaneous speech, their speech data is actually recorded under controlled experimental condition. Furthermore, the current study will concentrate on the *interactional* function corresponding to the various sound patterns identified in doing Mandarin recyclings. The interactional function under discussion is not limited to delaying next item due, but also other interactionally related functions, such as word search, projecting semantic contrast, or recyclings located at sequentially-significant turns, such as the dispreferred second pair part in an adjacency pair.

2.3 Repairs in Mandarin Chinese

Repair in Mandarin conversation has been discussed within several past studies (Chui, 1996; Tao, 1995; Tseng, 2003; 2006; Zhang, 1998). Most of these studies approach the phenomenon of repair based on the Conversation Analysis approach or from a discourse perspective (cf. Chui,

1996; Tao, 1995; Zhang, 1998), while some are based on computational linguistics and adopted statistical analysis (cf. Tseng 2003; 2006). Among these previous studies, only Chui (1996) and Tseng (2003; 2006) take a quantitative analysis toward the distribution of different types of repairs in Mandarin conversation. One common finding from these three studies is that, in Mandarin conversation, *repetition* repair is the most frequent type of repair[5]. Tseng (2006) further finds that most simple repetitions in her collected repairs involve only one phrase, or single phrases constituted of a monosyllabic or disyllabic lexical item, which belongs to the frequently used lexical items in spoken Mandarin. Moreover, according to Tseng, the most frequently repaired syntactic categories in Mandarin conversation are nouns, adverbial phrases and verbs (2006: 97). Thus it is suggested that the function of repetitions in Mandarin repair tends to be *pragmatic*, and whenever a Mandarin speaker comes to a point of repair, the easiest way is to repeat the word with error, or the *reparandum*[6] located immediately prior to the repair point so as to keep on with the speaking turn (Tseng 2006).

Of all the previously mentioned studies on Mandarin repair, only Tseng (2006) touches upon the prosody of repairs in Mandarin speech. Part of her study reports results from a statistical analysis of the prosodically defined variables of Mandarin repairs (Tseng 2006). In order to determine whether Chinese repairs are prosodically marked or not[7], Tseng (2006) takes prosodic measurements, including duration, intensity, and pitch value, of the comparable *reparandum*, which refers to "the erroneous part of the speech", and *alternation*, which is "the correction of the problematic sequence", of both repeated and corrected repairs (Tseng 2006: 82). The findings in her study demonstrate that there are clearly prosodic marking on both repeated and corrected repairs in that the *alternation* parts of both types of repairs are marked by a faster tempo, a shorter duration, and a weaker intensity (Tseng 2006). The pitch values of the onsets of

the *reparandum* and *alternation* parts, however, are *not* significantly different (Tseng 2006: 108). Tseng explains that the result of pitch values might indirectly indicate a pitch reset[8].

Although the study by Tseng has taken an initial step toward the prosody of Mandarin repairs, it emphasizes more the prosodic markedness of Mandarin repairs. One remaining question to be addressed, is what exactly does the "prosodic markedness" of Mandarin repairs do in the conversation? As explained in the last section, Levelt and Cutler's study shows that prosodic marking in English repair may be an indicator for semantic factors; while Shriberg suggests that prosodic properties of English disfluent repetitions reflect either the retrospective or prospective function. Tseng's study on the prosodic markedness of Mandarin repairs, however, doesn't really tell us much about why Mandarin speakers would choose to mark the onset of the alternation parts with faster tempo, shorter duration and weaker intensity. Instead of pursuing how the individual acoustic variables such as pitch value, intensity and duration are used to mark the repetition in Mandarin repairs, the current study emphasizes how these acoustic variables might combine to form possible sound patterns in achieving various communicative purposes. Moreover, as will be demonstrated in the main discussion, more than one sound pattern as combination of the acoustic variables have been identified. For instance, one of the sound patterns identified in doing Mandarin repair involves a longer *reparandum* followed by a rather compressed *alternation* in a pitch range that is smaller than the pitch range of *reparandum*[9]. It will be shown that this pattern can be used in recyclings located in dispreferred actions, such as delayed acceptance or disaligning action. Further discussion will focus on why the interlocutors pair the sound pattern with specific interactional function. Eventually, the study attempts to uncover specific pragmatic and interactional functions of Mandarin recycling repair via its prosodic realization in natural conversation.

2.4 Conversational phonology and interactional prosody

Some of the studies within the field of Interactional Linguistics are devoted to the discussion of the relationship between prosody and interaction in conversation. But it is not until recently that interactional linguists have started paying attention to the organization of phonetic details in relation to interaction in natural conversation. Studies taking this approach of "conversational phonology" (cf. Local et al. 1986) or "interactional prosody" (cf. Couper-Kuhlen and Selting 1996), include: Couper-Kuhlen (2001); Couper-Kuhlen and Selting (1996); Couper-Kuhlen and Ford (2004); Kelly and Local (1989); Local (1992); Local and Kelly (1986); Local et al. (1986).

According to Ford and Couper-Kuhlen (2004), this new approach to phonetics that focuses on spontaneous conversation started out with Kelly and Local's book *Doing Phonology* (1989). In their discussion of a *phonology for conversation*, Kelly and Local suggest incorporating an approach to the study of sound systems with the following theoretical points:

- The material considered derives entirely from naturally occurring face-to-face conversational interaction
- The analysis attempts to prejudge as little as possible the salience of phonetic features
- The analysis seeks explicitly to motivate and warrant the functional categories employed by reference to the observable behaviour of the conversational participants

(1989: 263)

In other words, "no invented or hypothesized material" or pre-determined phonetic or phonological categories are assumed or "allowed to contribute to the analysis" (Kelly and Local 1989: 263). Instead, Kelly and Local (1989) advocate an "impressionistic" analysis by closely listening to the production of real speech and notating phonetic details which a trained ear could perceive, including properties such as pitch, loudness, tempo, and others. By adopting a conversational phonology approach, they attempt to demonstrate that "a close consideration of

the content and structure of conversational talk can contribute to the identification and elaboration of relevant functional categories for phonological analysis" (Kelly and Local 1989: 263).

Actually, prior to Kelly and Local (1989), Local, Kelly and Wells (1986) have adopted this approach of "conversational phonology" to examine the general phonetic resources that are employed by speakers of Tyneside, a non-standard variety of British English. This conversational phonology approach is proposed, as these researchers seek to avoid the pitfalls, such as in overly selective handling of the phonic materials and the reliance on analysts' intuitions in setting up functional categories from other approaches (Local et al 1986: 411-412). Instead, it is suggested that, to advance our understanding of discourse and conversational phonology, it is essential: a. to make as few *a priori* decisions about the relevance of particular phonetic events as possible; b. the transcription of pitch, loudness, tempo, rhythmic, and other phonic phenomena be carried out consistently and impressionistically; c. the impressionistic record be used as the basis for establishing phonological categories (Local et al 1986: 413, emphasis in original). Some of the applications of the conversational phonology approach to the British dialect Tyneside conversational data include Kelly and Local's 1989 study on the function of the word-repeat turn in interviews with speakers of the British dialect Tyneside. In the findings they reveal that various interactional functions are associated with distinct phonetic patterns recurrently accompanying word repetition (Kelly and Local 1989). So when interviewees repeat the word in interviewer's question for the function of **understanding check**, the word in repetition is characterized by a falling pitch contour and louder volume; while when the repetition functions to imply **mulling over**, the word is carried out in a falling pitch starting from the mid of the speaker's pitch range and a longer duration (Kelly and Local 1989: 281).

Along the same vine, Couper-Kuhlen and Selting (1996) argue for the importance of bringing together the study of speech prosody and language-in-use and advocate an interactional approach toward speech prosody. In their discussion, Couper-Kuhlen and Selting (1996) explain in detail some problems within the traditional approach to speech prosody, including: the formal prosodic categories are difficult to determine, the function of prosodic patterns is not necessarily distinctive, and the weakness in the methodology of relying on analyst's own intuitions without taking context into consideration. So a "remedy" to these problems is to adopt an interactional perspective in examining speech prosody (Couper-Kuhlen and Selting 1996). Specifically, here Couper-Kuhlen and Selting employ the fundamental assumptions of conversation analysis and emphasize the methodology of using empirical data of naturally occurring talk to provide an interactional explanation for the prosodic realization (1996). Only when the data is treated as an integral part of the context and as emergent in the real time of ongoing interaction can analysts reconstruct prosodic patterns as cognitively and interactionally relevant categories (Couper-Kuhlen and Selting 1996). Ultimately, an interactional analysis of prosody will enrich our understanding of how conversation works.

In a study on prosody in talk-in-interaction, Schegloff suggests approaching prosody "as a set of recourses and practices by which participants interactively produce a conversation" (1998: 235). By focusing on conversation as one form of talk-in-interaction, Schegloff (1998) takes the approach of viewing prosody as a set of practices within the organization of conversation. Specifically, in the study Schegloff examines three episodes of conversation and demonstrates that one of the ways in which intonation figures in the organization of turns at talk and of turn-taking is to use pitch peak to project upcoming turn completion (1998). Also, it is shown that

prosody can be deployed for specific sequential organization within conversation, such as the initial turn in the opening of a telephone conversation could undergo a "negotiation" over the pitch level, like the following example:

(5)
1. ((ring))
2. Nancy: H'llo:?
3. Hyla: Hi:,
4. Nancy: HI::.
5. Hyla: Hwaryuhh=
6. Nancy: =Fi:ne how'r you, (Schegloff 1998: 245)

Schegloff explains that, in this opening of this telephone conversation, Nancy in line 4 uses a high-within-her-range pitch with the 'hi' after a first exposure to Hyla's voice, to "do" the interactional action of expressing recognition of the caller and implying "really pleased to hear from you" (1998: 245). In line 5, Hyla initiates a first pair part of an adjacency pair with a lower pitch register, while Nancy in line 6 chooses to respond to the question in a pitch range that drops to an equivalent of Hyla's level-within-range. Thus Schegloff suggests that this change in pitch height shows a divergent interactional alignment towards the incipient conversation that resolves into a convergence (1998: 245).

In addition to Schegloff's study, there have been studies focusing on the phonetic realization of organization and actions previously identified in the framework of interactional linguistics (cf. Couper-Kuhlen and Selting, 1996; Ford and Couper-Kuhlen, 2004), such as Local and Kelly's study on turn holding and projection of more talk by the same speaker (1986), Local's study on continuation with a turn after turn holding (1992), Local, Kelly and Wells on turn delimitation (1986), French and Local on turn-competitive incomings in multi-party conversation (1983), and Couper-Kuhlen's study on the use of high onset at the first TCU from callers in phone-in

programs to announce the reason for their calls (2001).

Some of the studies taking the conversational phonetic approach focus on "dimensions of patterned sound production in talk-in-interaction" (Ford and Couper-Kuhlen 2004). In addition to pitch level, there have been studies concentrating on phonetic features such as "glottal holding" silences (Local and Kelly 1986), the phenomenon of "rush-throughs" in Schegloff's study (1987), or the "adrupt-joins" with localized tempo effects and "disjunctive" prosodic characteristics by Local and Walker (2004). Also, some studies examine the prosodic realization of specific sequence types, such as Ford, Fox and Hellemann's study on turn-types with the negative particle *no* in American English (2004), or phonetic structure of specific format, such as Curl's studies on turn repetitions in other–initiated repairs (2002; 2004). Lastly, but not least, the study of interface between prosody and conversation has been extended to languages other than English, such as studies based on Japanese (cf. Tanaka 2004), and Finnish conversation (cf. Ogden, 2004; Ogden, Hakulinen and Tainio, 2004) from the collection on sound patterns in interaction by Couper-Kuhlen and Ford (2004).

In the current study of the sound realization of Mandarin recycling repairs, I incorporate the philosophy behind the approaches of *conversational phonology* and *interactional prosody* to examine the sound patterns derived from the actual use of recyclings in Mandarin conversation. When referring to the approach, I use the term *interactional prosody* introduced by Couper-Kuhlen and Selting (1996). It should be noted that, when examining the sound patterns in the Mandarin recycling examples, I follow Kelly and Local's suggestion (1989) and in that no category presumed as to whether certain phonetic features, such as longer duration or higher pitch height, should be interpreted as "marked" cues. In the process of making acoustic

measurements, I use the software program Praat for carrying out more precise acoustic analysis, but with additional help of "impressionistic" analysis[10].

2.5 Chapter summary

In this chapter I provided reviews of relevant studies on repair from interactional linguistics, psycholinguistics, and computational linguistics, then described the theoretical background to the methodology in analyzing sound patterns in Mandarin recyclings for the current study. First of all, I summarized findings related to same-turn repair, focusing on the sound or prosodic aspects of doing repairs in American English conversation. One of the places that the current study can draw upon is the discussion of how same-turn repairs are initiated. I then turned to the discussion of repair, or disfluency in psycholinguistics and computational linguistics. As the previous studies on disfluency by either approach were based on data from controlled experiments or designed tasks, the results from these studies didn't dwell much on the interactional aspects of the sound realizations in the repair.

In the third section of the chapter I reviewed the research of repair in Mandarin Chinese. Based on the findings by Chui (1996) and Tseng (2003; 2006), I choose to focus on the *repetition* repair, or *recycling* repair as one of the methods of doing repair in Mandarin conversation in the current study. Though there has been study suggesting there is a "marked" prosodic manifestation for Mandarin repair (cf. Tseng 2006), no past research has really attempted to address the relationship between the sound realizations in correlation with the interactional and/or pragmatic functions of Mandarin repair. In the current study, I take the approach of *interactional prosody* to explore the sound patterns in Mandarin recyclings as the

"forms", in correlation with the "function" of the recyclings in interaction and the sequential-organization of the conversation.

Lastly, I reviewed the methodology incorporated in the analysis of sound patterns in Mandarin recyclings, namely *interactional prosody*. This recently developed approach focuses on the sound or speech prosody that has not been categorized by any pre-conditioned rule or feature, but seeks to resort to an interactional perspective in the analysis of speech prosody. In the next chapter I provide further details on how I employed the approach of *interactional prosody* in the analysis of the data, as well as the process of data collection and preparation.

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[1] Note here that in this study, cases of simple recycling repair are not the center of discussion. Only part of the study mentions recycling repair in English conversation.

[2] The 5 methods under the group of "recycling with change" include: "prosody repair", "rearticulation", "recycle-and-change", "accented recycle-and-change", and "reversion" (Jasperson 1998).

[3] For a detail discussion of findings on sound patterns identified and the corresponding interactional functions, please refer to Chapter 4.

[4] For an introduction of the research methodology incorporated in the current analysis, please refer to the discussion in Chapter 3.

[5] Chui's finding shows that 42.6% of her repair examples (195/458) belong to *repetition* repair (1996). Tseng (2003) finds that 47.5% of the repair examples (653/1374) belongs to the type of complete repetition. According to Tseng (2006), more than 60% of the simple repair examples in her data are simple repetitions, while almost all complex repair are produced in combination with repetitions.

[6] Following Levelt (1983) and Shriberg (1994: 7), here the term *reparandum* is used by Tseng to refer to "the stretch of speech to be deleted" so as to recover the original speech text without correction or error.

[7] According to Tseng (2006), here the definition of prosodic markedness follows Levelt and Cutler's explanation on the prosodic markedness of examples of error repair (e.g. the blue the green one).

[8] Here Tseng is referring to the *reset hypothesis*, which states that spoken utterances obey the baseline declination (2006: 85). It is explained that, for a repair in an utterance, the F0 value of the beginning of the alternation part would be rest approximately to the F0 of the beginning of the reparandum (Tseng 2006: 85).

[9] For further discussion of the specific sound pattern, please refer to Section 4.5 in Chapter 4.

[10] For a detail description of the process of data preparation and acoustic analysis, please refer to Section 3.1.2 in Chapter 3.

Chapter 3 Data and methodology

This chapter describes the conversational data employed in the study, as well as the analytic procedures adopted in analyzing the sound patterns in doing Mandarin recycling repair. The chapter is divided as follows. Section 3.1 provides details on the data collected for the current study and the pre-processing of the data in order to prepare for acoustic analysis. Section 3.2 explains the procedure of analysis, including steps in data analysis and the methodology adopted for carrying out acoustic measurements. In Section 3.3 I turn to how the study defines the sound patterns identified from examples of Mandarin recyclings, and the relationship among the sound patterns, including *sub-patterns* that carry similar interactional function to the major sound patterns identified but differ from other sound patterns in some sound features. Section 3.4 is the chapter summary.

3.1 Data collection and pre-processing

As introduced in Chapter 2, the present study incorporates the methodology of *interactional prosody*, which is based mainly on the philosophy behind the Conversation Analysis approach to the prosodic patterns identified in carrying out Mandarin recycling repair. Following Couper-Kuhlen and Selting (1996), as well as Kelly and Local (1989), the recycling examples

will be derived from naturally occurring face-to-face Mandarin conversational interaction.

In the following subsections, I first describe the data adopted for the current study. Section 3.1.2 focuses the process of pre-preparation for the data. Section 3.1.3 explains the type of recycling examples identified and the type of recyclings included in the "recycling corpus" established for the purpose of the current study.

3.1.1 The data

In the current section I provide descriptions of each videotaping and audiotaping. Part of the description also includes ethnographic information about participants in each recording, although this background information was not employed in the analysis. There were a total of 10 conversational participants recorded, all female[1]. Out of the 10 conversational participants, the data from two speakers were excluded from the analysis, as one is not a native speaker of Mandarin (but speaks the language fluently), and the other is not from the same region as other participants. The rest of the speakers are all native speakers of Mandarin Chinese and from the northern regions of Taiwan[2]. All participants were aware that they were being recorded for the purpose of a linguistic research, though they may or may not be aware of the nature of the research. All conversations are casual, face-to-face, and spontaneous; there were no prescribed

conversational topics set for each recording, and there was no required participation from each speaker (so in at least one of the recordings participants would stop by to join in the conversation or leave the conversation as they chose to do so).

The only videotaping from which examples of recyclings were culled is coded in the transcripts with the prefix "CA". This recording took place in 2003 using a Sony Camcorder. The camcorder was set up by one of the speakers in the living room of her apartment in Boulder, Colorado. There were two participants in this recording segment and they were identified as C and H in the transcripts. C is a female graduate student at University of Colorado, in her 20's. H is also a graduate student at University of Colorado, in her 20's. Both speakers grew up in Taipei, Taiwan and spent most of their lives in Taipei city before coming to Colorado to pursue their graduate studies. This recording was originally made for the purpose of a linguistics class project. Though both speakers were aware of this purpose, the content of the recording was not in anyway pre-scripted and was as casual and spontaneous as other natural interaction. The total time of this recording was approximately one hour. Five segments of the whole conversation were transcribed after the recording, each lasting from 5 to 10 minutes.

The first audio-taped conversation, coded with the prefix "AU-01", was collected in Colorado May 2008. The recording was done using an Olympus WS-311M digital voice recorder. The recorded interaction took place in the apartment of two of the participants, E and S. Both E and S are female Mandarin speakers in their 30s', and both were exchange graduate students studying at University of Colorado during the time of recording. There were two additional participants in this multi-party conversation: speaker Y, a female graduate student at University of Colorado, in her 20's, and speaker K (myself), also a graduate student at University of Colorado, in her 30's[3]. Although S speaks fluent Mandarin, she is actually not a native speaker of Mandarin. Speaker S participated in only part of the recording session, and none of the repair produced by S was included in the current research. The other three speakers all grew up and spent most of their lives in Taipei, Taiwan before coming to Colorado. The conversation was on random topics and was relatively spontaneous. Total time of recording was approximately one hour.

The audio-taped conversation tagged with the prefix "AU-02" was recorded using the same Olympus digital voice recorder described previously. This conversation took place in the apartment of two of the participants, R and S, in Boulder, Colorado, during July 2008. Both R and S are female native Mandarin speakers in their 20s', and both are graduate students studying

at University of Colorado. The other participants of this multi-party conversation included: speaker Y, a female graduate student at University of Colorado, in her 20's; speaker C also in her 20's, and speaker K (myself). C is a female elementary school teacher from Taipei County, Taiwan, and C was visiting Y in Colorado during the summer of 2008. Among all the five speakers, most of them spent the majority of their lives and studied in the northern part of Taiwan, except R. R is from Kaohsiung County (GaoXiong), which is located in the southern part of Taiwan. In order to exclude the factor of regional dialectal differences, examples of recyclings produced by R were not included in the present research. The content of the conversation was very casual and spontaneous. Total recording time was about one hour.

The audio-taped conversation coded with the prefix "AU-03" was recorded in my apartment in Boulder, Colorado, during September 2008. Using the same Olympus digital voice recorder, the conversation recorded was between two speakers, speaker S, in her 20's, a female graduate student from University of Colorado and speaker K (myself). Both speakers grew up in Taipei City, Taiwan and speak Mandarin Chinese as their native language. The two speakers know each other as they were studying in the same department. The content of the conversation was casual and spontaneous. Total recording time was about twenty minutes.

The audio-taped conversation "AU-04" was also recorded during September 2008. Using the same Olympus digital voice recorder, the conversation took place in my apartment at Boulder, Colorado. It was a casual conversation among three female speakers: speaker S, in her 20's, a female graduate student from University of Colorado; speaker A, in her 30's, a female lecturer at University of Colorado, and speaker K (myself). Both S and K grew up in Taipei City, Taiwan, and A grew up in Taoyuan City, Taiwan. All three speak Mandarin Chinese as their native language. Total recording time was almost to an hour.

The fifth audio-taped conversation, with the prefix "AU-05", was recorded during November 2008 by the same Olympus digital voice recorder. The conversation took place in one of the speaker's offices in Boulder, Colorado. This speaker is identified in the transcription as A, who is a female lecturer at University of Colorado. The other speaker is K (myself). Both speakers are in their 30's, and both grew up in the northern part of Taiwan and speak Mandarin Chinese as their native language. The content of this conversation was spontaneous and none of the topics were pre-set or pre-determined. Total recording time was approximately one hour.

The last audio-taped conversation with the prefix "AU-06" was recorded during December 2008. Using the same digital voice recorder, the conversation took place in a hotel room in San

Francisco, California. There were two participants in this recording: speaker L, in her 30's, a female lecturer at Pennsylvania State University, and speaker K (myself). L and K are sisters. Both speakers grew up in Taipei City, Taiwan and speak Mandarin Chinese as their native language. The content of this conversation was casual and spontaneous. Total recording time was approximately 15 minutes.

In the next subsection I turn to the pre-processing of the data.

3.1.2 Data pre-processing

After the recording of the conversational data, the first step in the data pre-processing procedures was to convert each recording into a separate WAV sound file. In order to prepare for the transcriptions of each recording, all WAV files were imported into the software program Praat (© Paul Boersma & David Weenink 1992-2008). Praat is a free downloadable computer program designed specifically for carrying out phonetic details and acoustic measurement of speech sounds. In the current study Praat is used for both providing precise measurements of the sound realization of the recyclings, as well as facilitating the transcribing process.

The second step was to prepare the transcription out of the recorded conversational data. In transcribing the conversational data, the *turn construction unit* (henceforth TCU, cf. SSJ 1974)

from the approach of Conversation Analysis has been incorporated as the basic unit of transcription. One thing to note is that the whole segment of each videotaped and audiotaped recording had been converted into complete transcripts. For the videotaped conversation tagged with the prefix "CA", five segments from the whole conversation were selected and transcribed, as mentioned earlier[4]. As for the six audio-taped conversations, I transcribed two segments of conversation out of the recordings prefixed "AU-01" and "AU-03", the former a 9-minute transcription and the latter a 17-minute transcription. The rest of the transcription was done only around the examples of recyclings. All transcripts done in the present study followed the conventions of the transcription system developed by Gail Jefferson (cf. SSJ, 1974; Ochs et al., 1996). This system was originally designed for transcribing conversation in American English. In transcribing the current Mandarin conversational data, the standard orthography of *Hanyu Pinyin* has been employed, with additional symbols to mark the temporal and sequential relationships among the turns, as well as aspects of speech delivery, including the intonation from the transcription system[5]. In addition, the transcripts employed extra symbols specifically for transcribing cut-offs, e.g. the dash "-" for a "soft" cut-off and the percent sign "%" for a glottalized one, following Jasperson (1998; 2002)[6]. The detailed notation conventions employed in the transcription are provided in Appendix A.

In the next section I turn to the identification of recycling repair from the transcription and the establishment of the "recycling corpus".

3.1.3 The "recycling corpus": identification of recycling repair

After transcribing the conversational data based on TCUs, the next step was to identify examples of Mandarin recycling repair from the conversational data. As mentioned in Chapter 1, in the current research I follow Schegloff's definition of recycling as "a brief, sometimes a longer repeat or re-saying of part of the utterance occurs in a conversational turn" (1987: 71). In other words, during the process of identifying cases of recyclings, it was a rather straightforward task to simply look for repetitions of words or phrases in the first place from the transcription or when listening to the recordings of conversation. As suggested earlier, during the process of identifying the recyclings from the Mandarin conversational data, I used the computer software Praat to assist the process.

Though simple repetitions were not difficult to detect from our data, this did not entail, however, that all examples of repetitions were considered examples of recycling for the action of repair. Most of all, repetitions for the purpose of emphasizing were excluded. One such example is the repetition of the adverb *zhende* 'really' at line 3 in (1):

(1) AU-03

1.	S:	>fanzheng<	wo	xianzai	jiushi	yao	tui	le	(.)	w	yao	tuichu
		anyway	1sg	now	precise-CP	Aux	quit	Asp		1sg	Aux	quit
2.		(.4)										
3.	K:	tuichu	shenme=									
		quit	what									
4.	S:	= zhongwen °xuexiao										
		Chinese school										
5.		(.3)										
6.	K:	·hh	BUYAO	[LA	S::::]							
			Neg-Aux	FP	PN							
7.	S:	[>ynwei<	wo	juede]	J	jiu	hen-	(.)	wo	shi		
		because	1sg	feel	PN	just	very		1sg	CP		
→ 8.		**zhende**	**zhende**:	dui	ta	shi	juede	**hen**	(.5)	**hen**	shangxin	
		really	really	Prep	3sg	CP	feel	very		very	hurt	

S: '>Anyway< now I just want to quit. I want to quit.'
(.4)
K: 'Quit what?='
S: '=Chinese School.'
(.3)
K: ·hh 'Don't![S::::]'
S: '[>because< I feel] J was just very- (.) I'm **really really** felling **very very** hurt by her.'

In this conversation, S in line 1 talks about quitting something, but it is not clear to K exactly what S wants to quit. After the adjacency pair seeking for clarification in lines 3 and 4, K expresses in a surprised tone to ask S not to do so in line 6. Then S provides her explanation about why she wants to quit teaching Chinese school. In offering the explanation, S cuts-off after the adverb *hen* 'very' in line 7, followed by a short pause to abort the turn-so far. Afterwards she re-constructs the turn, and repeats the adverb *zhende* 'really' to emphasize how disappointed she feels. Examples of repetitions for emphasis, such as this, were not considered as cases of recycling repair.

A typical example of recycling repair from our Mandarin data is as follows:

(2) CA-05-Sgr-003.5

1.	C:	>wo	youmeiyou<	gen	ni	jiang	guo		
		1sg	have-Neg-have	Prep	2sg	say	Asp		
2.		(.3)							
3.	H:	meiyou							
		Neg have							
4.	C:	o=	meiyou	ma=					
		Ex	Neg have	Q					
5.	H:			=meiyou					
				Neg have					
→ 6.	C:	yinwei	**ta::** (.3)	**ta**	>xuyao	yige	zhongwen mingzi<		ma
		because	3sg	3sg	need	one-CL	Chinese name		FP
7.		>wo	jiu	shou<	a: >	wo	an-< bang	ni	xiangyixiang zheyang
		1sg	Adv	say	Ex	1sg	help	2sg	think like this

C: '>Have I< told you about that?'
(.3)
H: 'no.'
C: 'o= haven't (I)?='
H: '= not yet.'
C: '(It was) because **she:: (.3) she** >needs a Chinese name<.
>So I said<, a:, >I'll< help you to think about it, like this.'

This fragment of conversation starts with the adjacency pair in lines 1 to 3. When the question by speaker C in line 1 is answered by H with a negative response *meiyou* 'no' in line 3, C follows up with another question in line 4 as confirmation. After yet another negative answer in line 5, C initiates the story that she's about to share. Just getting started with the turn, C pauses shortly after the 3rd person singular pronoun *ta*. Then the speaker resumes the turn by repeating the pronoun that she had just uttered. So here C carries out a single word *recycling repair*, by an immediate *repairing* of part of the turn-so-far. The recycling is realized as a

repairable segment (the first mention of the personal pronoun *ta*), followed by a short 0.3-second pause and then the *repairing* segment, which is a repetition of the same pronoun.

In the present study, I use the term *repairable* segment (also R1) to refer to the word or phrase in which the repair is initiated, and the term *repairing* segment (also R2) to refer to the repeated word or phrase that is doing the repair.

It was mentioned in chapters 1 and 2 that some previous studies on Mandarin repair have suggested that *repetition* repair is the most frequently used type of repair (cf. Chui, 1996; Tseng, 2003; 2006), and Mandarin speakers consistently initiate recyclings after recognizable completions (Fox et al. 2009). Thus it was expected that for the majority cases of our recyclings, the *repairing* segment would be a complete repetition of the *repairable* segment. During the process of identifying cases of recyclings from the Mandarin data, however, there were some examples in which the *repairable* corresponds to the first syllable, or part of the *repairing* segment, such as:

(3) CA-01-Sgr-031

1.	H:	dui a	dui a	wo	juede	zhuyao	shi	huanjing		
		right Part	right Part	1sg	feel	mainly	CP	environment		
2.		keshi::	xiang	wo - (.)	◦ wo	shang yici		you yici		
		but	like	1sg	1sg	last one-CL		there one-CL		

→	3.	nai -	gen	wo	**tong: tongshi**		lai	na	yinian
		those	Prep	1sg	same	same time	come	that	one year
	4.	naxie -	taiwan	nusheng=					
		those	PN	girl					

H: 'Right right, I think mainly it is the environment,
but:: like, I- (.) ◦ I last time, there (was) once that,
those- who came in the **sa: same** year as me,
those- Taiwanese girls,'

At line 3 H stops after uttering the lengthened syllable *tong* in initiating the recycling. The full form of the lexical item *tongshi* 'at the same time' in the *repairing* segment follows right after the *repairable* segment. Repair examples of this type were identified as *partial-initiation recycling repair*, and the recycling in (2) were termed *full-initiation recycling repair*.

Still one more type of *full-initiation recycling repair* that should be mentioned is when the recycling involves a third repetition of the same word. In (4) the first person singular pronoun *wo* at the turn-beginning position of line 4 has been repeated three times in the process of doing recycling:

(4) CA-04-SGR-084

	1.	H:	ranhou	(.)houlai	jiushi:	·hh (.7)	chiwan	wufan	yihou	women	
			then	afterward	then-CP		eat-RC	lunch	afterwards	1pl	
	2.		you hua	le	yici	ta	jiu	zuo lanche	xiaqu	◦ zheyang[zi(.)	dui ah]
			again ski	Asp	once	3sg	then	take gondola	RC	this way	right-FP
	3.	C:									[nhunn]
→	4.	H:	ranhou	wo-	**wo%**	**WO<**	YEshi	huade	man	beican	de
			then	1sg	1sg	1sg	also	ski-adv	pretty	tragic	Nom

```
H:  'Then(.)afterwards that was: ·hh (.7)after lunch we skied one more
    time and she took the gondola down, like th[is, (.) right].'
C:                                              '[nhunn]'
H:  'Then I- I% I< ALso was skiing pretty tragically,'
```

Recycling such as this would still be considered a valid example of full-initiation recycling repair and included in the recycling corpus for the current study[7]. One additional note is that, for recyclings involving third repetitions, I carried out the acoustic measurements on the second and third mentions of the repair, i.e. the second *wo* in (4) was identified as R1 and third *wo* R2.

In all, there were approximately 260 cases of recyclings identified, including both instance of full-initiation and partial-initiation recyclings, but excluding examples that occurred in overlapped turns or produced with background noises. This collection of recycling examples is referred to as "the recycling corpus" or "the corpus" in the following discussion.

After identifying and collecting examples of recyclings, the next step was to carry out acoustic measurements for each recycling. Detailed description of the procedures is provided in the next section.

3.2 Methodology for phonetic measurements

The fourth step was to analyze the phonetic or prosodic realization of the recycling repairs from the corpus. To analyze sound production, various phonetic measurements were made for

the *repairable* and *repairing* items of each token of recycling repair. These measurements were mainly made using the computer software Praat (© Paul Boersma & David Weenink 1992-2008). Additional judgments would be made based on the analyst's impression and interpretations of most of these auditory cues, following Kelly and Local's impressionistic approach (1989) described in Chapter 2[8]. These acoustic measurements were: **pitch**, **loudness, silence**, **duration**. Additional perceptible prosodic cues such as **cut-off** or **lengthening** were noted as well. The following subsections provide further elaboration regarding how these measurements have been taken and how these sound production features will be reported.

3.2.1 Pitch height

The pitch height of the onset of the *repairable* and *repairing* segments of the recycling was measured and then compared. Note that when the recycling involved word or phrase of more than one syllable, the onset of each syllable in the recycling was measured and the compared. If the onsets of both segments of the recycling didn't yield any measurable pitch contour (such as an onset with a fricative [s] or [x]), the pitch height of the initial vowel would be taken instead. Here the pitch height refers to the fundamental frequency (F0), and is recorded in Hertz (Hz).

Sometimes when the F0 difference between R1 and R2 was too small to be considered as hearable difference, the measurement of *semitone* was incorporated to help determine if the R1

and R2 might be perceived as realized at the same pitch height. A cut-off point of 0.5 semitones was incorporated[9]. At times, the measurements on pitch height via using Praat yielded no result (in the situation when no pitch contour was derived) for the whole R1 or R2, and an impressionistic judgment was incorporated. In such cases, the results of pitch height reported in the Tables summarizing acoustic measurement result throughout the thesis may be presented as either H (higher than the corresponding syllable in R1/R2) or L (lower than the corresponding syllable in R1/R2). Finally, in cases where no measurement was yielded and no decision could be made as for the relative pitch height between R1 and R2, the question mark "?" was recorded when presenting the result of acoustic measurements.

3.2.2 Loudness

Here loudness refers to the relative amplitude between the repairable and repairing segments of the recycling repair. The measurement was taken by locating the point of highest *intensity* in R1, compared with the intensity of the same point in the segment of R2 of the recycling. The measurements taken by using Praat were recorded in decibels (dB). After the measurement of intensity was recorded for each recycling, the result was checked against the researcher's impressionistic judgment toward the whole R1 and R2 segments of the repair. If the measurement reported in decibels was not consistent with what the researcher perceived as the

louder segment of the recycling, the exact measurement was not reported. In this case, the exact measurement was not reported but was marked by a question mark "?" instead.

At times no contour of intensity was shown from either R1 or R2 of a recycling via Praat. In that case, the judgments of relative loudness between R1 and R2 were made, based solely on the researcher's impressionistic judgment. When reporting the result, the loudness was indicated by the relatively *louder* (marked by L) or *quieter* segment (marked by Q) of the recycling in Tables presenting the result.

One additional point to make about the measurement of *loudness* is that the result on loudness was reported only when a consistent pattern of louder R1 or R2 across the recycling examples of the same sound pattern was identified.

3.2.3 Silence

The category of silence records and measures, in seconds, any audible pause located before the repairable, after the repairing segment, or in between R1 and R2 of the recycling. In the current study a cut-off point at 0.2-second has been applied, following Jasperson's study on focused English repair (1998). According to Jasperson, after the focused repair is initiated by cut-off, two alternate events can happen: either a "delay" of significant pause, or a "beat of

silence" followed by the immediate resumption of talk (1998: 88). In the latter case, a "beat" of silence roughly corresponding to 0.2 seconds, and post cut-off pauses that are shorter than a "beat of silence" are not significant with respect to repair (1998: 88)[10]. In the current study, any silent pause under 0.2 seconds was considered as part of the articulatory process and was treated as having no significant impact on the process of recycling. Silent pauses longer than 0.2 seconds were taken as serving possible interactional functions, and were reported with exact measurements.

3.2.4 Duration

Duration refers to the length of the repairable and repairing items of the recycling, reported in milliseconds. The measurement of duration was taken starting from the onset to the ending vowels or nasal consonants[11] of the word or phrase in the R1 and R2 of the repair. One note to point out here is that, sometimes when the duration difference between R1 and R2 of the recyclings is quite small (there are cases when the difference in duration between R1 and R2 is less than 20 milliseconds), a question regarding if such brief difference in duration would be perceivable to the interlocutors. In order to make a distinction of the duration difference between R1 and R2 of the recyclings in some of the sound patterns identified, a statistical analysis of *T-test* is incorporated.

While taking measurements of duration, additional notes were made about other prosodic cues, including **sound stretches** and **cut-offs**. Note here that if either R1 or R2 was accompanied by the cues of sound stretching or cut-off, either or both sound cues were included when measuring the duration of R1 or R2. The features of **cut-off** and **sound stretch** are explained in the next subsection.

3.2.5 Other prosodic cues: cut-offs and sound stretch (lengthening)

Following Jasperson (1998; 2002), here cut-off is defined as an articulatory closure that interrupts the airstream, and it typically involves glottal or other stop closure. To determine if there is a cut-off occurring in the conversation, I follow the impressionistic description of ways in which cut-off is articulated, as proposed by Jasperson (1998; 2002)[12]. At least two types of cut-off were distinguished: "glottalized" cut-offs, which have salient interruption glottalization, and "soft" cut-offs that have either unnoticeable or no interrupted glottalization (cf. Jasperson 1998; 2002). In the transcription, a percent sign "%" is used to indicate glottalized cut-offs, while a dash "-" for soft ones (cf. Jasperson 1998; 2002).

The prosodic cue of **sound** stretch, or **lengthening** recorded any perceptible prolongation on any syllable of the repairable and the repairing items of the repair. To determine if there were

perceivable sound stretches, an impressionistic judgment was made and the result was marked on the transcription, if any lengthening was observed. It should be noted that for the identification of both cut-offs and sound stretch, those were made mostly based on the impressionistic judgment from the researcher or the transcriber.

One final point to be added here is that, although in the current study I chose to focus on the aforementioned acoustic cues in formatting sound patterns for doing Mandarin recyclings, this does not imply that these sound cues are the only features contribute to the interpretation of interactional function of the recyclings. As will be seen in the discussion in Chapters 4 and 5, there are some other sound cues that may play a role as well. Next I turn to how the sound patterns in the realization of recyclings were identified, how the association between sound patterns and interactional functions were established, and defining relationship among sound patterns and "sub-patterns".

3.3 Identification of sound patterns and relationship among patterns

After taking acoustic measurements for each token of recycling repair, the fifth step was to identify all the possible "sound patterns" out of the prosodic realization of the recyclings. This step was carried out by first inputting the results of acoustic measurements into Microsoft Excel

files. Then recyclings with similar sound manifestations in terms of the relative measurement of each acoustic cue between R1 and R2 would be grouped together, e.g. recyclings realized in the sound pattern of "longer R1, followed by R2 at a higher pitch height". Sound patterns as such were identified, with further notations on the location of silent pauses in relation to the R1 and R2, as well as if the recycling was initiated by the prosodic cues such as cut-offs or lengthening. When all the possible sound patterns were identified, the last step was to establish the interactional function correlated with each of the sound pattern.

As mentioned in section 3.1.3, to establish the recycling corpus, 260 examples of recyclings were culled from the Mandarin conversational data, including both full-initiation and partial-initiation recycling repair. Then by employing aforementioned research procedures, at least 10 distinct sound patterns were identified from 143 full-initiation recycling examples selected[13]. Some of these patterns, however, were found in only a few instances of recyclings. For the present study, the sound patterns realized in too few recycling instances were excluded from the current discussion, as no conclusive finding could be reached for the possible interactional function from these recyclings. Moreover, the present thesis will not discuss examples of partial-initiation recycling repair. (In total there were 56 instances of partial-initiation recycling repair identified.)

After identifying all the robust sound patterns (i.e. patterns that have more than 5 recycling examples), the last step was to locate the interactional function corresponding to each sound pattern. When turning to the discussion of interactional function of the recyclings, I employed a *qualitative*, case-study approach based on the principles of Conversation Analysis. The goal of the study is to explore the possible sound patterns as the *forms* in correlation with specific interactional *functions*. When presenting the result, I first use at least two examples in the same sound realization to establish the sound pattern as the *form*. After identifying the sound pattern, next I turn to explore the interactional *function* shared by the examples in the same pattern. Additional instances in the same pattern that function similarly will be also provided. Eventually, further explanation will be provided as to why Mandarin speakers utilize a sound pattern as combination of particular sound cues for a specific interactional function, e.g.. why the Mandarin speakers use the pattern **[longer R1 with lengthening and a fall-to-low ending]+[significant silence]+[R2 at higher pitch height]** in the recyclings for the function of *word* or *content* search, as the longer R1 followed by the significant pause may gain the current speaker more time during the action of word/content searching, and when the speaker is finally prepared to continue, they incorporate a higher pitch on the R2 to signal that[14].

In the following Chapters 4 and 5, I present 6 distinctive sound patterns identified, each corresponding to a very specific interactional function. The discussion of these 6 patterns covers 112 recycling examples out of the 143 recyclings selected.

Moreover, one important question here is, how do we determine if two sound realizations should be considered two separate sound patterns? The rule of thumb is that, if each of the two patterns carries a rather distinct interactional function, I take the two realizations as two separate sound patterns. It should be noted, however, that there were cases when I found two sound realizations functioning quite similarly in terms of interaction. Whenever there was similarity present in the functions, or when two sound realizations were used in the same interactional function, it would be suggested to treat the two as in the relationship of *sub-patterns*. As will be seen in the following discussions, for the 6 sound patterns identified, two patterns have additional *sub-patterns* that are used in recyclings with similar interactional function. Basically, the *sub-patterns* may be distinguished from the main patterns in one or more than one sound cues, e.g. different methods in initiating the repair by either cut-off or lengthening; or if there is a falling-to-low pitch contour at the end of R1; or if a longer pause between R1 and R2 is required or not. Here the term *sub-pattern* is posed only as a surface terminology and does not carry any additional implication of subordination relationship among the sound patterns, nor does it bear

any statistical implication that a *sub-pattern* would be used in fewer cases of recyclings.

3.4 Chapter summary

This chapter introduced the data incorporated in analyzing sound patterns in Mandarin recycling, as well as the methodology adopted in the analysis. This study is based on recyclings culled from 7 video- and audio-tapings of naturally occurring conversational interaction in Mandarin Chinese. The conversations were casual and rather spontaneous.

After transcribing the data, instances of recycling repair were identified from the transcripts to establish the recycling corpus. Approximately 260 cases of recyclings were culled from the transcripts, and among those 56 instances were identified as partial-initiation recycling repairs. To analyze the prosodic realization of the recyclings, acoustic measurements were made by using the computer software Praat. The measurements include: **pitch**, **loudness, silence**, **duration**, as well as additional perceptible cues such as **cut-off** and **lengthening**. After taking acoustic measurements, the recycling examples were categorized by the same sound manifestations, e.g. the recyclings with longer R1 in a higher pitch height (than R2). Also, further examples at overlapped turns and with background noises were excluded. As result, the corpus was narrowed down to 143 recycling instances.

Lastly, when all the recycling examples were categorized based on the sound patterns, attempts were made to locate the interactional function correlated with each pattern, and the relationship among the sound patterns. One the basis of *qualitative* analysis, the current study reports 6 distinctive sound patterns, which cover 112 examples from the narrowed down corpus. Sound patterns with less than 5 recyclings were excluded from the current discussion.

In Chapters 4 and 5 findings of the major patterns identified, and the analysis of the interactional function corresponding to each pattern will be presented.

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[1] There was no specific reason that the speakers who contributed data for the present study were all female, but rather by accident. The advantage of having the data from only female speakers is to exclude gender difference as a factor. It should also be mentioned that, in a relevant study on Mandarin filled pauses based on a large speech corpus by Zhao and Jurafsky (2005), it is reported that gender does not have a significant effect on the use of filled pauses in Mandarin.

[2] Here the northern regions of Taiwan refer mainly to the region from Taipei City to Taoyuan County in the northern part of Taiwan. At least one of the subjects is from Taoyuan and the other speakers are from Taipei City.

[3] One place to note here is that, I have participated in all the audio and video recordings produced for the purpose of current study as one of the interlocutors. Although I participated in

all the 7 segments of recorded conversations, I did not transcribe nor include all recycling examples produced by myself from each recording. In order to avoid over analyzing the data produced by myself, I only included recyclings produced by myself from selected recordings.

[4] I transcribed 4 of the 5 segments of the videotaped conversation. A fifth segment of transcription was provided courtesy of Charlene Lee.

[5] It should be noted that sometimes when transcribing the conversation, I simplified the *Hanyu Pinyin* of certain syllable within a lexical item so as to better reflect the actual pronunciation of the word in the conversation recorded.

[6] In the following Section 3.2.5, a more detailed explanation on the articulatory cue of cut-offs will be further introduced.

[7] For recyclings such as this, it was treated as one example in the recycling corpus, not as two consecutive recyclings.

[8] One additional note here is that, of all the acoustic cues considered in the current study, the impressionistic judgments were adapted to various degrees while reporting the result of measurements. For the prosodic cues such as cut-off and lengthening, the judgment of their presence was based almost 100% on the impressionistic judgments. For loudness and pitch height, all the measurements had been checked against the impressionistic judgments (though the result was presented mostly in dB for the former and Hz or semitone for later). Finally, for silence and duration, as both sound cues involve the measurement of time, the result was much more relying on the measurement in second or millisecond via Praat.

[9] In the present study the cut-off point of 0.5 semitones has been incorporated, as there has been past studies discussing listeners' ability to identify synthetic vowel-like sounds presented concurrently in pairs to the same ear (i.e. Summerfield and Assmann 1991) and it is found that

subjects are able to identify constituents of such pairs more accurately when they differ in F0 by about a half semitone or more, compared to the condition where they have the same F0 (Summerfield and Assmann 1991). Following these past studies, here I use 0.5 semitones as the cut-off point when measuring the pitch height difference between R1 and R2 of the recycling.

[10] In addition to the empirical evidence that in his corpus of focused repair, a "beat of silence" seems to emerge after roughly 180 milliseconds from the onset of cut-off, Jasperson further provides three sources to support his claim (1998). For one, the patterning of focused repair in his study simply makes reference to this metric of delay (Jasperson 1988: 88). Moreover, Jasperson (1998) suggests that resumptions of conversation preceded by periods of silence briefer than approximately 0.2 seconds were not heard or seen as a delay of the repair. Lastly, there's indirect support from CA research, c.f. Levinson (1983) which indicates that pauses of less than 0.2 seconds between turns are not analyzed as delays, where as pauses of 0.2 seconds or greater can be.

[11] For explanation on the Mandarin syllable structure, please refer to Li and Thompson (1981).

[12] For detailed description, please refer to Jasperson (1998; 2002).

[13] Also, during the process of carrying out acoustic measurements, additional examples with background noises or at overlapped turns were further excluded.

[14] For further discussion of this sound pattern and its interactional function, please refer to the discussion in Section 4.3, Chapter 4.

Chapter 4 Findings I: Sound patterns 1 to 5

This chapter is the one of the two that present the results of the current study, namely the major sound patterns identified from our recycling corpus, and the interactional function corresponding to each pattern. This chapter examines five sound patterns identified in Mandarin recycling repair. These five sound patterns share one prominent sound feature in that their repairable items (R1) are realized in *longer* duration than the corresponding repairing items (R2). Actually, Tseng (2006) also reports that in the prosodic realization of Mandarin repair, the *alternation* (or R2) part on average is the shorter segment in Mandarin repair[1]. Our finding of the relative length between R1 and R2 in Mandarin recyclings is thus consistent with Tseng's finding in that, of the 143 cases of full-initiation recyclings from our corpus, there are only 25 instances realized with longer R2s. In other words, more than 80% of these recyclings are realized with longer R1s.

In the current chapter I present the findings of Mandarin recyclings realized with the sound feature of *longer* R1. In addition to the relative length, another sound feature to distinguish each sound pattern is the relative pitch height between R1 and R2. Some other prosodic features that are incorporated into the categorization of each sound pattern include: perceivable silence occurred in between R1 and R2, and additional articulatory cues such as cut-off or

lengthening at the end of R1 to initiate the repair. All the sound patterns described in the main chapters will be presented in terms of combinations of these prosodic cues. After establishing each sound pattern, I will explore further the interactional function corresponding to each pattern. As will be seen, the five sound patterns each corresponds to a rather distinct interactional function.

This chapter is divided into six main sections. Section 4.1 presents sound pattern 1, which is realized with R1 and R2 on the same pitch level, in addition to a longer R1 in the recycling. Section 4.2 and 4.3 introduces patterns 2 and 3 respectively, and the recycling examples in both patterns are realized with R2 at a higher pitch height but these two patterns are distinguished by if there is a lengthening at the end of R1 or not. Section 4.4 provides a description of recyclings in a sound pattern with longer and higher R1. In Section 4.5 I turn to the fifth sound pattern that still has a longer R1, but the pitch range between the highest and lowest points in R2 falls within the pitch range of R1. Section 4.6 is the chapter summary.

4.1 Pattern 1

In this section I examine the first of the five sound patterns that are realized with longer R1 in the recycling. The following section 4.1.1 describes sound pattern 1 via some recycling

examples. Section 4.1.2 explores the interactional function corresponding to pattern 1. 4.1.3 is the section summary.

4.1.1 Pattern 1: **[longer R1 with cut-off]+[R2 at same pitch height]**

To start, consider the recyclings at the arrowed turns in examples (1) and (2) below:

(1) CA-05-Sgr-004

1.	C:	>ni	zhidao	ma<	jiu	haoxiang:	>biruo	shuo<	(.3)	shenme	Von-
		2sg	know	Part	just	like	for example			what	PN
2.		(.)	[Va	(	)]	>huozhe	shenme<	[[jiushi]]			
			PN			or	what	precisely-CP			
3.	H:		[unhunh]					[[nhun]]			
4.	C:	zhongjian	nage	zi	qishi	shi	of	de	yisi		
		middle	that-CL	character	actually	CP	of	Nom	meaning		
5.	H:	o::.	[okay]								
6.	C:		[huozhe]	shi	O'connor	>youmeiyou<					
			or	CP	PN	have-Neg-have					
7.		[[you	yige]]	apostrophe	ranhou-	[shenme	de]				
		there	one-CL	apostrophe	then	what	NOM				
8.	H:	[[okay]]				[unhunh]					
→ 9.	C:	·h	suoyi	**ta-**	**ta**	qishi	nage-	nage	V	keneng	shi of
			so	3sg	3sg	actually	that-CL	that-CL	V	possibly	CP of
10.		◦keneng◦	shenme	shenme	shenme	of	shenme	zheyangzi			
		possibly	what	what	what	of	what	like this			

C: '>you know<, it's just like:, >for example< (.3) what Von-(.)
[Va ( )], >or what<, [that is],'
H: '[unhunh], [nhun]'
C: 'the word in the middle actually is of the meaning 'of'.'
H: 'o:, [okay].'
C: '[or] (it) is like O'connor, >right<?
[[There's an]] apostrophe and then [whatever].'
H: '[[okay]] [unhunh].'
C: '·h So **she- she**, actually that- that V possibly is 'of',
◦probably◦ like, something something something of something,
like that.'

(2) CA-02-Sgr-012

1.	H:	· hhh	[◦ wo	bu	zhidao]	weishenme	hui	you	zhezhong	guannian	
			1sg	Neg	know	why	Aux	have	this-CL	concept	
2.	C:		[suoyi-]								
			so								
3.	C:	[[hhhh]]									
4.	H:	[[◦ I don't know]]	(0.4)		dui	[ah]					
		I don't know			right	FP					
→ 5.	C:					[s]uoyi	**ta**%	**ta**	yeshi	juede	shuo::
						so	3sg	3sg	also-CP	feel	say
6.		(.3)	YEXU	eventually	hui	hui	tai[[wan]]				
			perhaps	eventually	Aux	return	PN				
7.	H:							[[ya:::]]			
								Ex			

```
H:  '· hhh[ ◦ I don't know] why (he) would have such thought'
C:       '[so-]'
C:  [[((laughing))]]
H:  '[[I dont' know]]. Righ[t].'
C:                          '[s]o he% he also feels:: (.3) PERHAPS
    eventually (they) will go back to Tai[[wan]].'
H:                                        '[[ya::]]'
```

In example (1), C is talking about the English name of a mutual friend and explaining which part of the friend's name should be considered as the friend's last name. In line 9 the speaker recycles the third person singular pronoun *ta*. In example (2), prior to this selection of conversation, C asks H if H's sister and brother-in-law will return to Taiwan after they finish their studies in US, and H gives a lengthy answer that her brother-in-law's father suggests them to stay and find jobs. C makes a statement in lines 5 and 6 to confirm that eventually they might return. Here she recycles the personal pronoun *ta* at the beginning of line 5. Table 4-1 below summarizes the result of prosodic measurements of the two recyclings in (1) and (2):

	Pitch height (Hz)		Semitone (re 100Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2	R1	R2
Ex (1)	236	245	15.0	15.6	231	179	<0.2S	No
Ex (2)	303	310	19.1	19.6	223	141	<0.2S	No

Table 4-1 The acoustic measurements of recyclings in Ex (1) and (2)
(R1=repairable item in the repair; R2=repairing item in the repair)

As can be seen from Table 4-1, there is less than 10 Hz difference in pitch height between R1 and R2 in each recycling. A further measurement based on **semitone** shows that, for these two recyclings, the pitch difference between R1 and R2 is around 0.5 semitones in both cases[2]. In other words, R1 and R2 in both recyclings are produced at almost the same pitch height, though it is still possible to distinguish which counterpart is at a slightly higher pitch level. Second, the measurement of duration shows a consistent result of the longer R1 in both recyclings. One additional observation is that, if we turn to the transcription, both recyclings are realized with **cut-offs** at the end of their R1 (the cut-off could be either a soft cut-off or a glottalized one, marked by the dash "-" and "%" respectively in the transcription[3].) These cut-offs, however, do not result in shorter a R1, compared to the length of the corresponding R2. Note that for the measurement of loudness, there doesn't seem to be a conclusive result about if R1 is perceived as the louder counterpart. So the result of loudness is not reported in the Table. Finally, for silence, in both examples R1 is followed by a pause under 0.2 seconds[4].

To summarize, there is a consistent sound pattern realized in these recyclings, with a longer R1 ending in a cut-off, followed immediately by R2 of almost the same pitch height. The following format is thus proposed to account for the prosodic realization in these recyclings:

(3) **[longer R1 with cut-off]+[R2 at same pitch height]**

In addition to a shared sound pattern, another similarity between these two recycling examples is that both cases involve the repetitions of personal pronouns. I will address how such commonality between these recyclings may shed light on the discussion of the interactional function correlated with this sound pattern in the following discussion in Section 4.1.2.

Some additional examples of this pattern follow in (4) and (5):

(4) AU-022-Sgr-018

1.	Y:	xiao-C	buyao	shuijiao	oh		
		little-PN	Neg-Aux	fall asleep	FP		
2.	C:	bu-hui					
		Neg-Aux					
→ 3.		((sound))	**wo%**	**wo**	huiqu	xizao	keyi ma
			1sg	1sg	return	take a shower	Aux Q
4.	Y:	bu-xing					
		Neg-work					

Y: '(To C) Little-C, don't fall asleep!'
C: '(I) won't.'
'((sound))(can) **I**% **I** go back taking a shower, is it all right?'
Y: 'No.'

(5) AU-012-Sgr-011

1.	E:	oh	L	yijing	zou	le	oh		
		Part	PN	already	leave	FP	Ex		
2.	Y:	L::	yao	zou	le	ta (.)	xiage	libai	zou ba
		PN	Aux	leave	FP	3sg	next-CL	week	leave FP
3.	E:	oh::::=							
4.	Y:	= yeshi	wuyue	ershi-ji		wo	°jide=		
		also-CP	May	20th-something		1sg	remember		
→ 5.	E:	= **ta%**	**ta**	shi	yao:	jiu	huiqu	haishi	
		3sg	3sg	CP	Aux	just	return	or	
6.	Y:	hui	Taiwan	xian	huiqu	sangeyue	ranhou	zai	zhijie
		return	Taiwan	first	return	three-CL-month	and	again	directly
7.		qu	Seattle						
		go	PN						
8.		(.4)							
9.	E:	nianshu							
		to study							

E: 'Oh, L has already left.'
Y: 'L: is going to leave, she (.) will leave next week.'
E: 'oh::::='
Y: '=(it) is also around May 20th or something, I °remember=.'
E: '=Is it (that) **she% she** will: just return, or?'
Y: 'Going back to Taiwan, first going back for 3 months, and then (she'll) leave for Seattle directly'
(.4)
E: 'to study'

In (4), C makes a request to Y to go back and take a shower, but the action is declined. In line 3 C recycles the first person singular pronoun *wo*. In (5), both speakers are talking about a mutual friend, L. E thought L had already left Boulder, and Y explains to E about L's summer plan of returning to Taiwan first and leaving for Seattle later on. In line 5 E recycles the third person singular pronoun *ta*.

The acoustic measurements of the recyclings in (4) and (5) are summarized in Table 4-2:

	Pitch height (Hz)		Semitone (re 100Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2	R1	R2
Ex (4)	200	194	12.1	11.5	144	107	<0.2S	No
Ex (5)	287	290	23.5	23.7	216	112	<0.2S	No

Table 4-2 The acoustic measurements of recyclings in Ex (4) and (5)

From Table 4-2, the acoustic measurements of the recyclings in (4) and (5) confirm the sound pattern proposed in (3). Moreover, both recyclings have cut-offs at the point of repair initiation. Thus at least four recycling examples are identified to realize in pattern 1. Actually, 14 recyclings from the recycling corpus were identified in pattern 1 and at the same time of a Mandarin personal pronoun. In next section I move on to the interactional function corresponding to sound pattern 1.

4.1.2 Interactional function of pattern 1

So far sound pattern 1 has been identified as [longer R1 with cut-off]+[R2 at same pitch height]. In addition to sharing similar sound realization, the recyclings in (1), (2), (4) and (5) share other similarities in terms of the lexical category of the word in recycling, as well as the position of the recycling within the turn. With regard to the lexical category of the word in recycling, an interesting point to note is that all these examples involve Mandarin *personal*

pronouns. With regard to the location of the recyclings, all of the personal pronouns in recyclings are positioned in the initial position of the turn, although sometimes they follow a turn-beginning connective or conjunction such as *suoyi* 'so' (cf. Ex (1) and Ex (2))[5].

Here if we take a closer look at these recycling examples, it appears that the turns where these recyclings located function to convey *further explanation* of the current discourse topic by either the speaker of the turn or other interlocutors in the conversation. In (1) the turn in line 9 starts with *suoyi* 'so', which obviously marks an inferential connection (cf. Bolden 2009) between the current turn back to C's discussion on this friend's English name in lines 1 to 7. Turning to line 9, the turn *continues* to provide further elaboration on the current topic. On the other hand, in (2) the recycling of the personal pronoun is also preceded by the same discourse marker *suoyi* 'so'. As explained earlier, H provides a lengthy answer to a question by C prior to line 1, and in line 1 H has come to the end of the answer. Though during this last part of the answer, C attempts to initiate an interruption by the overlapped *suoyi* 'so', but she fails to continue in line 2. When moving on to line 4, it seems that H has reached the point of closure at the end of the turn. Towards the very last syllable of the turn, C overlaps again to initiate a question to confirm if H's sister and brother-in-law will eventually return to Taiwan. Here the question is marked by the discourse marker *suoyi* 'so', which carries similar function of using

English ‘so’ for “prefacing sequence-initiating actions” in order to indicate the status of the following action as “emerging from incipiency”, as suggested by Bolden (2009)[6]. Thus the turn initiated by the discourse marker *suoyi* ‘so’ can be viewed as “constituting a particular action as advancing the speaker’s interactional agenda” for the purpose of discourse coherence (Bolden 2009: 996).

When turning to (4) and (5), the two recycling examples differ from the recyclings in (1) and (2) in that there’s no additional element preceding the personal pronouns in the recyclings at the beginning of the turns. In (4), the recycling of the first personal pronoun *wo* is at the very beginning of the turn, and the turn is actually a request by C asking for “permission” to go back and take a shower. If we trace the conversation back to line 1, here this segment of conversation is mainly about exchanges between Y and C: Y “cautions” C not to fall asleep in line 1, then C complies in line 2 and *continues* with the action of request in line 3. As for (5) the recycling repair is also initiated at the very beginning of the TCU in line 5. Although there is no other connective or conjunction preceding the recycling at the turn-beginning position, the personal pronoun *ta* ‘she’ in the recycling actually refers to the mutual friend L, who has been the center of discussion in the previous turns.

As demonstrated in all these examples, these recyclings are located in the initial position of turns that may or may not be contingent to the immediately preceding talk[7]. But even with example such as (2) in which the turn is initiated by the discourse marker *suoyi* 'so', it can still be viewed as "characterizing an incipient action for the purpose of discourse coherence and accomplishing understanding" (Bolden 2009). As for the recyclings in (4) and (5), the personal pronouns in recyclings at the very beginning of the turns both refers to the persons under discussion in the prior discourse. Based on the observation, it is suggested that in Mandarin conversation, pattern 1 [longer R1 with cut-off]+[R2 at same pitch height] functions to *project a continuation of further explanation* on the current discourse topic, which has undergone some discussion.

Furthermore, the interactional function of *continuation of current discourse topic* is reflected in the sound realization when doing the recyclings. In terms of prosodic realization, the cut-off at the end of the repairable segment serves as the *repair initiator*. As the recycling is initiated by the cut-off at the end of R1, it also allows a quick restart, as has been observed by Jasperson in English focused repair initiated by cut-off (1998). Moreover, since the repair is done on a pronoun with reference to someone who has been mentioned just earlier in the conversation, and the current speaker uses the repair to project a continuous discussion on the same topic or the

same person, this could explain why the pause in between R1 and R2 in these recyclings is almost non-detectable. As for pitch height, the almost same pitch level between R1 and R2 could also suggest that the continuation of the same topic does not require the speaker to raise or lower the pitch but simply to maintain the same pitch level to keep on with the turn[8]. Finally, turning to the longer R1, it could plausibly be related to the location of the recycling at the turn-beginning position. When the interlocutor initiates the recycling of the turn-beginning personal pronoun, a longer R1 is naturally maintained to help the listeners better processing the turn that's about to be projected.

In other words, in Mandarin conversation speakers may use sound pattern 1 of a cut-off at the end of a longer R1, followed immediately by R2 of about the same pitch height when they recycle the beginning of a turn to inform the other interlocutors about the continuation or additional explanation on the conversation topic so far. As mentioned in Chapter 2 of Literature Review, there has been study on English recycling repair from the Conversation Analysis approach suggesting that turn beginnings are crucial places for initiating the projection of the turn shape or the turn type of the current TCU (cf. Schegloff 1987). Thus the finding here on the projection function of Mandarin turn-initial recyclings is consistent with the observation about English turn-beginning recyclings by Schegloff (1987). The Mandarin

recycling examples above, moreover, may be realized in a particular sound pattern with longer R1 followed by R2 at the same or almost same pitch height that also contributes specifically to this projection of a *continuation* on the same conversational topic. While the interpretation of this specific function of continuation can be derived from the connectives or conjunctions before the recyclings (cf. examples (1) and (2)), another possibility is that the sound pattern realized in the recyclings also contributes to this interactional function; especially for recyclings such as those in (4) and (5), in which the recyclings are located at the very beginning of the turns but without any connective or conjunction preceding the repair. In such cases, other participants in the conversation may have to rely on how the recycling is deployed prosodically as one of several cues that help make a judgment about how the current turn will be projected and shaped in relation to the previous TCUs and regarding the current conversational topics.

Here some additional observations are, for one, in the recyclings from examples (1) and (2) the speakers recycle the pronouns at the beginning part of the turns, but leave out the conjunction or discourse marker preceding the pronouns in recyclings. In terms of the scope of the recycling, actually, Schegloff (1987) makes the same observation, namely that in English conversation speakers often don't recycle turn-beginning discourse markers and adverbs. Thus, it is found that in Mandarin conversation interlocutors have a similar tendency of limiting the

scope of recycling and keeping the turn-beginning conjunctions and discourse markers outside the recyclings. Second, it is also important to provide some explanations on why it seems that most of the cases of recyclings in pattern 1 involve repetitions of personal pronouns. In fact, in addition to the 14 recyclings of personal pronouns in pattern 1, there are 5 more recyclings also in pattern 1 but are done on turn-beginning verbs or adverbial verbs. The following example is one of the five instances that don't involve recycling personal pronouns:

(6) AU-03-Sgr-023

1.	S:	keshi	yao	zao	yige	xiaoshi	ei		
		but	have to	early	one-CL	hour	FP		
2.	K:	women	yiqian	dou	zheyang	ah:[:::]			
		1pl	before	all	like this	FP			
3.	S:					[zhende:::=]			
						really			
4.	K:	= dui	ah	yiqian::					
		right	Part	before					
5.	S:	you le	[( )]						
		have Part							
6.	K:		[you]	cengjing	youguo	zheyangzi	ah		
			there	ever	have-Exp	like this	FP		
7.	S:	wa >da(j)ia<	bu	hui	shengqi	ma? hh			
		Ex everyone	Neg	Aux	angry	Q			
→ 8.	K:	jiu:: (.)	**zao- zao**	yige	xiaoshi	jiushi	qu	nabian::::	
		just	early early	one-CL	hour	then-CP	go	there	

S: 'but (you) have to (be) one hour earlier?'
K: 'It was all like this for us in the [past:::]'
S: '[really:::=]?'
K: '=yes, in the past::'
S: 'there?[( )]'
K: '[There] had been like this once.'
S: 'wa, wouldn't >everyone< be angry? ((laughing))'
K: 'just:: (.) getting there one hour **earlier- earlier** then,'

The recycling in (6) is realized acoustically in the same sound pattern 1[9]. The position of the recycling in this example within the turn is quite similar to the previous recyclings in (1) and (2). But instead of initiated on a personal pronoun; the recycling here involves an adverb (cf. *zao* 'early'). Interestingly, the very first lexical item at turn-beginning position is not included in the scope of recycling either (in (6) it is a connective preceded the recycling.) One possibility is that turn-beginning positions are syntactically more likely to be occupied by personal pronouns as the subject to the sentence or clause. But Mandarin also has the salient feature of incorporating zero-pronouns in discourse (cf. Li and Thompson 1981). When it comes to the case that the speaker zeros the sentence-initial pronouns, the next element of a sentence, i.e. the adverb or even turn-beginning verb, gets recycled. Based on the location of the recycling in (6) within the turn, it further substantiates the claim that sound pattern 1 could occur frequently in recyclings locating at the beginning of the turn, regardless the syntactic category of the word or phrase that involves in the recycling.

4.1.3 Section summary

In this section I have identified the very first sound pattern as [longer R1 with cut-off]+[R2 at same pitch height], and suggested that this pattern is used in some Mandarin recyclings for the function of *projecting a continuation of further explanation* on the current discourse topic. It

was shown that pattern 1 is employed almost exclusively in recyclings of personal pronouns at the beginning part of the turns, although a few instances of verbs and adverbs at turn-beginning positions have also been identified. Thus it is suggested that pattern 1 could serve as one of the turn-beginning sound patterns in Mandarin recyclings, and the preponderance of cases being pronouns has to do with the pronouns located at turn-initial positions in Mandarin. In terms of the sound realization, the cut-off at the end of the R1 functions to initiate the repair. Also the cut-off at the end of R1, followed immediately by the R2 without silence shows that the speaker is saving time to get into the next bit of the discouse. Moreover, the pitch height of R1 and R2 is almost the same, since the interlocutors are not starting something very new but only continuing with the current turn.

I now turn to an examination of the second pattern of recyclings in the data.

4.2 Pattern 2

In this section I examine the second of the five sound patterns with longer R1 identified from the corpus. In section 4.2.1, a description of sound pattern 2 is provided. Section 4.2.2 devotes to the possible interactional function correlated with pattern 2. Section 4.2.3 is the section summary.

4.2.1 Pattern 2: **[longer R1 with cut-off]+[R2 at higher pitch height]**

To illustrate sound pattern 2, I start with the following examples:

(7) CA-02-Sgr-030

1.	C:	jiu	xiang	xiang	women	zheyang	ah	women	ruguo-	ni-	ni
		just	like	like	1pl	this	Part	1pl	if	2sg	2sg
2.		prelim	guo	le	[zhihou::]						
		prelim	pass	Asp	afterwards						
3.	H:				[unh]						
4.	C:	ni	xianzai	quit (.)	ni::(.)	you	yige	shuoshi	de	zi[[ge]]	
		2sg	now	quit	2sg	have	one-CL	master	nom	qualification	
5.	H:									[[mm]]	
6.	C:	dui									
		right									
→ 7.		>°jiuxiang		tamen	nayang<	**tamen- >tamen**		shi	yao<		
		just like		3pl	like that	3pl	3pl	CP	Aux		
8.		kao zigekao			haishi	shenme					
		take qualify examination			or	what					

C: 'it's just like like us, if we- one- one passes the prelim and [afterwards:::]'
H: '[unh]'
C: 'you quit now (.) you::(.) would earn a qualifica[[tion]] of MA.'
H: '[[mm]]'
C: 'Right >°(It's) just like them, like that. <**They-** >**they** have to< take the qualifying examination or something like that.'

(8) AU-041-Sgr-028

1.	A:	·hh	ranhou-	erqie	hai	feichang	de	dasheng	wo	dou	juede
			then	besides	even	very	Nom	loud	1sg	even	feel
2.	S:	hhh									
3.	A:	↑zhende	shi	[TAI diu]lian	le						
		really	CP	too	humiliating	FP					
4.	K:			[hh]							
5.	S:	zhende::::		hen-	jiu	>kesh	wo%<	(.)	bieren	daodi	
		true		very	just	but	1sg		other people	at all	

6.		tingbuting-de-dao		[ah]							
		hear-Neg-hear-RC		FP							
7.	K:			[hh]							
→ 8.	A:	wo	zhege	ne::	**wo% (.)**	**wo**	FAshi	ta	yiding	ting-de-dao	
		1sg	this-CL	Part	1sg	1sg	swear	3sg	must	hear-RC	

```
A:  '·hh then- besides, (it) was really loud, I felt'
S:  '((laughing))'
A:  '(That) was REALLY [too hu]militating!'
K:                    '[((laughing))]'
S:  'truly:: very- (it's) just, >but I%< (.) could it be heard
    by others at [all]?'
K:                '[((laughing))]'
A:  'This one of mine:: I%(.) I SWear, for sure s/he must hear (it)!'
```

In the fragment of conversation in (7), C is explaining to H about the process of getting a PhD in the area of chemistry, which C's boyfriend is considering studying. Since C and H both study in the same PhD program, C uses their PhD program as a comparison in lines 1 to 5. At line 7, she recycles the pronoun *tamen* 'they' in the middle of the turn. In (8), A is describing an embarrassing moment when she was in her office with another instructor, and an abdominal sound occurred. At line 8, she recycles the pronoun *wo* 'I' after a topicalized noun phrase.

The acoustic measurements of these two recyclings in (7) and (8) are presented in Table 4-3 below:

	Pitch height (Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2
Ex (7)	243-245	296-253	246	189	no	no
Ex (8)	224	245	228	153	<0.2S	no

Table 4-3 The acoustic measurements for recyclings in Ex (7) and (8)

Based on these measurements, we can see that the pitch height of R2 in both recyclings is higher than the corresponding R1[10]. As for the relative length between R1 and R2 in each recycling, R1 is always longer than the corresponding R2. One item to note is that, in both examples, there are cut-offs at the end of R1 (the cut-off could be either a soft cut-off or a glottalized one, as shown in the transcription.) The silence in between R1 and R2 is always under 0.2 seconds. Sometimes the speaker may even start R2 right after the end of R1 (i.e. in (7)). Finally, as no consistent result could be arrived about the relative loudness between R1 and R2, it is not reported in the table. Thus the following sound format has been proposed to account for these facts:

(9) **[longer R1 with cut-off]+[R2 at higher pitch height]**

After establishing sound pattern 2, in the next subsection I turn to the identification of the possible interactional function correlated with pattern 2.

4.2.2 Interactional function of pattern 2

If we turn back to the two recycling examples in (7) and (8), incidentally these two recyclings also involve recyclings of personal pronouns. In (7), the recycling at line 7 is done on the 3rd person plural pronoun *tamen* 'they'. As explained earlier, in this selection of

conversation, C is comparing the PhD program that she and H attend with the chemistry PhD program that her boyfriend is applying to. In lines 1, 2 and 4, C talks about the requirement of hers and H's PhD program. Then in line 7 she moves on to talk about the other PhD program. Note C in line 7 starts the turn with the statement *jiu xiang tamen nayang* '(it's) just like them, like that,' and the 3rd person plural pronoun *tamen* refers specifically to 'people who are studying towards a PhD in chemistry.' Up to this point, C has reached a possible transition relevant place (TRP). Then C continues the turn right away with the recycling, before moving on to talking about the exact similarity/difference between the two programs. In this turn C actually shifts from talking about the PhD program of hers and H's to the chemistry program. Note that up to the TRP, C is in a faster speech rate and quieter voice when providing the statement *jiu xiang tamen nayang* '(it's) just like them, like that.' Then turning to the next bit of conversation about the other PhD program, there is the recycling with its R2 emphasized, i.e at higher pitch height. Here it is suggested the recycling could function to initiate and project the actual content of *comparison* in order to further explain the similarity and/ or difference between the two programs.

On the other hand, in lines 1 and 3 of (8), A describes how embarrassing it was when an abdominal sound occurred. Moving on to line 5, S tries to initiate an assessment to the

embarrassing situation described by A in the previous utterances. But before getting to the actual content of her assessment, S aborts the turn. S then tries to re-project the turn and eventually switches to a question, which addresses a general situation of 'if the sound could be heard by others' and attempts to eliminate further embarrassment caused by a direct assessment. In addressing the question, A doesn't provide a direct answer, but starts with a topicalized noun phrase *wo zhege ne* '(as for) this one of mine'. What follows the topicalized NP is the recycling initiated by a cut-off at R1, followed by R2 at a higher pitch height that highlights the emphasis, as if informing the other interlocutors that 'I'm talking about this one that happened to me,' but not the general situation when that occurs to others.

Based on the above illustration of the functional aspect of the recyclings in sound pattern 2 [longer R1 with cut-off]+[R2 at higher pitch height], it is proposed the pattern functions to *project a semantic contrast*. Evidently, the recycling on *tamen* 'they' in (7) is initiated by a cut-off at the end of R1, followed by the R2 at a relatively higher pitch height to signal a shift from talking about the speaker's own PhD program to another program; while the recycling of *wo* 'I' in (8) with the same prosodic features indicates the speaker is switching to talking about her own case as opposed to other people's general experience. In fact, Jasperson's 1998 study on English same-turn recycling repair initiated by cut-offs also reports a similar observation.

One of the methods of carrying out English repair is via *change of prosody* (Jasperson 1998)[11]. According to Jasperson, an accented R2 in doing English repair, including recycling and replacement repair, can signal a *semantic contrast* (1998). Some indirect evidence to support such observation is that there are also past studies showing a low rise L-H% intonation at the end of turns functions to project upcoming contrast (cf. Ogden, 2006; Ward and Hirschberg, 1985). Here it is found that Mandarin speakers make use of similar prosodic feature of a change in pitch height on R2 of the recycling for the function of signaling *a semantic contrast*.

A further example of this pattern follows[12].

(10) CA-04-SGR-084

	1.	H:	ranhou	(.)houlai	jiushi:	·hh	(.7)	chiwan	wufan	yihou	women	
			then	afterward	then-CP			eat-RC	lunch	afterwards	1pl	
	2.		you hua	le	yici	ta	jiu	zuo lanche xiaqu	◦ zheyang[zi(.)		dui-ah]	
			again ski	Asp	one-CL	3sg	then	take gondola DC	like this		right-FP	
	3.	C:									[nhunn]	
→	4.	H:	ranhou	wo-	**wo%**	**WO<**	YEshi	hua-de	man	beican	de	
			then	1sg	1sg	1sg	also	ski-adv	pretty	tragic	Nom	

H: 'Then (.) afterwards, that was: ·hh after lunch we skied one more time and then she took the gondola down, [like this, right].'
C: '[nhunn]'
H: 'Then I- **I%** **I**< WAS also skiing pretty tragically,'

Prior to this fragment of conversation, H is recounting a ski trip that she went on with some friends. One of H's friends P, who had never skied before, joined the trip, but didn't quite enjoy the first skiing experience. From the utterance by H in lines 1 to 2 it shows that H has

come to an ending point in describing part of the trip (the 3rd person singular *ta* refers to P). When H resumes the telling in line 4, she begins the turn with the conjunction *ranhou* 'then', followed by a recycling of the first person pronoun *wo* 'I'. While H continues the narration about the ski trip after the recycling, however, she *shifts* from talking about P's skiing story to what happened to herself during the trip. The recycling thus functions quite similarly to the previous two recyclings in initiating a *semantic contrast* in the discussion of current conversational topic. Here it seems that speakers in Mandarin rely on this sound pattern with a higher pitch on R2 in recyclings when *projecting forward* a semantic contrast of the ongoing conversation, i.e. the interlocutors use the pattern to signal that they are about to shift to talking about someone or something else.

One place to be pointed out here is that, so far the three recyclings in sound pattern 2 all involve the repetition of certain personal pronouns. If we look closely at the recycling of the first personal pronoun in (10) again, it occurs after a turn-beginning conjunction *ranhou* 'then'. In terms of location within a turn, the recycling in (10) is quite similar to the recycling examples in pattern 1 discussed in Section 4.1. Though there is the similarity in the location, the recyclings are realized in distinct sound patterns, with different sound features for specific functions, i.e. the recyclings in pattern 1 have R1 and R2 at almost the same pitch height for the

function of *continuation* while the recyclings in pattern 2 are realized with higher R2. As suggested, the higher R2 in pattern 2 serves the function to *project forward* a *semantic contrast*. Based on the difference in the function each pattern correlated with, it is suggested here to establish the two sound patterns as separate patterns.

A count of the occurrence of instances from the corpus shows that at least 25 examples of recyclings are realized in pattern 2. Of the 25 recycling examples, 8 are initiated at personal pronouns, including those in (7), (8) and (10) above. Another interesting observation is that, of the 8 recyclings in pattern 2 that involve repetitions of personal pronouns, only two are located at the turn beginning position, such as the recycling in (10). The other 6 instances of recyclings are initiated in the middle or later on in the turn. When turning to the rest of the 17 recyclings that do not involve repetitions of personal pronouns, all the recyclings are initiated later on in the turn. In the following examples, two non-pronoun instances are given[13]:

(11) AU-042-Sgr-001

1.	S:	wo	jide	shi	yige	laoshi	ei: (.2)	ta	shuo::	(.2)	yisi				
		1sg	remember	CP	one-CL	teacher	FP	3sg	say		meaning				
2.		shi	shuo:	shou	women	hen- (.)	gui	oh	jiu	R	(t)a	houlai			
		CP	say	take	3pl	very-	expensive	Ex	Adv	PN	3sg	afterwards			
3.		gen	w-	ta	jiu	shuo·hh	jiu	shou	women	shizai	shi	hen	gui	ah	
		with	1sg	3sg	Adv	say	Adv	say	1pl	truly	CP	very	expensive	FP	
4.		(1.2)													

5.	S:	jiushi		GUOji	xuesheng		hen	GUI::						
		precisely-CP		international	student		very	expensive						
6.	K:	(.5) oh::[::]												
7.	S:		[suo]yi		zhe	you	shi	ge	hen	da	(d)e	wenti	dian	
			so		this	again	CP	CL	very	big	Nom	problem	point	
8.		=<	houlai	xiang	qishi	( )	guojixuesheng					zhende	shi-	
			afterwards	think	actually		international student					really	CP	
→ 9.		(.)	tingshuo	yige	shi	**gen-**	(.)	**gen** <tamen		bi				
			hear-say	one-CL	CP	Prep		Prep	3pl	compare				
10.		shi	yi	bi	si									
		CP	one	to	four									

S: 'I remember it was a teacher ei: (.2) s/he said: (.2) (it) means that: that it is very-(.)expansive to accept us. Oh, it was R, and then s/he just (told) m- afterwards, s/he just say ·hh just say it is really expensive'
(1.2)
S: 'that was, it costs a lot to accept INTERnational students.'
K: (.5) 'oh::[::]'
S: '[So] this is also a point of huge problem=< later on, (I) thought (about it), indeed international students are- really, (.)(I) heard that the ratio between (us) **to-**(.)**to**< them is one to four.'

(12) AU-041-Sgr-002

1.	A:	na::-												
		then												
2.	S:	zuo	zheige	ah	((to K))									
		sit	this-CL	FP										
3.	K:	dui	dui	dui	yinwei	nage	[hui]							
		yes	yes	yes	because	that-CL	Aux							
→ 4.	A:						[ei]	nimen	xishang	**you-you**				
							Ex	2pl	department	there	there			
5.		zhongguoren	de	laoshi	ma	[[yuyan]]xuexi		MEIYOU=						
		Chinese	Nom	teacher	Q	linguistics department		Neg-have						
6.	K:					[[mei]]							=meiyou	
						Neg							Neg-have	
7.		weishenme	yao	wen	zhege::									
		why	Aux	ask	this-CL									

A: 'then::'
S: 'sit (on) this one.' ((to K))
K: 'right, yes, yes, because that [will]'
A: '[hey], (is) **there- there** (any)

```
    Chinese teacher at your department? [[Linguistics]] Department.
    NO=?'
K:                                      '[[No]]
        =no, why do you want to ask?'
```

In (11), S explains some problems she encountered when applying for PhD programs. One of the problems mentioned in this segment of conversation is that it costs more for the department to accept international students than domestic students (as both speakers are international students studying in the US). In (12), A asks the other two speakers K and S a question regarding if there is any Chinese instructor or professor at the department that K and S belong to (A is a language instructor teaching at a different department from K and S.)

Although they are not initiated in personal pronouns, the recyclings in (11) and (12) share the same sound pattern with the recyclings in (7), (8), and (10). If we turn to the context where these two recyclings occur, they both reach the point where the speakers are about to *project a contrast*. The recycling of *gen* 'with' in (11) is followed by a third person plural pronoun *tamen*, which refers to 'domestic students' and is in contrast with the demonstrative pronoun *yige* 'one' that refers to international students in line 8. In (12), on the other hand, the recycling is done to project *an action* in contrast. Starting in line 1, A tries to draw attention from the other two interlocutors, but fails to do so as S and K are in the middle of another action (S is directing K to sit somewhere else, while K complies). Before K can finish her turn in line 3, A overlaps and takes over the turn to ask the question. To initiate the question about whether there is any

Chinese instructor in K and S's department, A recycles the existential *you* 'there' after the turn-beginning NP *nimen xixhang* 'your department'. Here the recycling not only initiates and projects a new start to the action to be compared, it also directs the interlocutors' attention from the action in the previous turn to a new action of posing a question in the first pair part (FPP) of the adjacency pair.

So far I have identified sound pattern 2 as [longer R1 with cut-off]+[R2 at higher pitch height], and suggested that the pattern is used specifically for the function of projecting a *semantic contrast*, or even an *action in contrast*. In terms of the sound, first of all, the repair examples in pattern 2 are initiated by cut-off at the end of R1. As for the pitch height, it was demonstrated that the higher pitch on R2 in the sound pattern could highlight a new start of the utterance and thus reflect the function of *projecting a semantic* contrast. Furthermore, from the sound format presented, R1 is longer than R2. A plausible explanation is: if turning back to the transcripts of some of the examples above, we can find that there are cases when the R2 is in a faster speech (i.e. in (7), marked by the transcription symbol "> <"), or when the speakers finish the recycling they would "jump start" from the end of R2 right into the next syllable (i.e. in (11), marked by the *less than* "<" transcription symbol). This may contribute to a *shorter* R2, as the speaker may be eager to hurry into the new information to be projected.

One more point to emphasize here regarding pattern 2 is that, since it has been identified that the pattern is associated with the function of *projecting a semantic contrast*, the item or action in comparison would only be projected *after* the recycling is initiated, i.e. either at the R2 of the recycling (i.e. for examples (7), (8), and (10), when the recyclings involve personal pronouns), or after the recycling is done (i.e. for examples (11) and (12)). In other words, the interlocutors also utilize the recycling to project *forward* the upcoming viewpoint for contrast. This is, again, related to the higher pitch height on R2 to highlight the new viewpoint.

4.2.3 Section Summary

In this section I first established sound pattern 2 as [R1 with *cut-off*]+[R2 at higher pitch height] and suggested that the pattern is used in some Mandarin recyclings for the function of *projecting a semantic contrast*. In terms of sound realization, the function of *projecting a semantic contrast* is mainly reflected in that R2 is at a higher pitch height than the corresponding R1. Contrasting with sound pattern 1 discussed in Section 4.1, pattern 2 was identified in recyclings that occurred not just in the turn-beginning position. Actually, most of the recyclings in pattern 2 occurred later on within the turn.

In the next section, I will turn to the third sound pattern, which is realized with a lengthened R1 and additional silence after R1.

4.3 Pattern 3

In this section I introduce the third major sound pattern identified from our recycling corpus. As will be shown, sound pattern 3 differs from the previous two sound patterns mainly in that there is a significant silence right after R1. In the following section, sound pattern 3 will be identified. Section 4.3.2 provides further analysis of the interactional function corresponding to pattern 3. In Section 4.3.3 I turn to some variations of pattern 3 and determine whether these variations should be considered **sub-patterns** or separate sound patterns. Section 4.3.4 is the section summary.

4.3.1 Pattern 3: **[longer R1 with lengthening and a fall-to-low ending]+[significant silence]+ [R2 at higher pitch height]**

Consider the following examples:

(13) AU-05-Sgr-014

1.	A:	[zuotian]	huran	(.3)	xiang	qu	chi	sushi	
		yesterday	suddenly		want	go	eat	fast food	
2.	K:	[°hh]							
3.		(.8)							
4.	A:	suoyi	xiang	qu	zhao:	(.5)	yinwei	wo	pingchang-
		so	think	go	look for		because	1sg	usually

→ 5.	hui	qu	chi	fried chicken	jiu	hui	qu	**na↓ge: (.3)**	**nage**	Popey
	Aux	go	eat	fried chicken	then	Aux	go	that-CL	that-CL	PN

A: '[Yesterday] (I) suddenly (.3) was craving for fast-food.'
K: '[°hh]'
(.8)
A: 'So (I/we) thought about looking for: (.5) because usually- when I want to eat fried chicken (I)'d go for **that:**↓ (.3)**that** Popey.'

(14) AU-012-Sgr-021

1. Y:	erqie	wo	baoxian	shi	bao	bijiao	gui	de	ta	baoxian
	besides	1sg	insurance	CP	insure	more	expensive	Nom	3sg	insurance
2.	pianyi	dehua	dagai	ershi	kuai	shi zh-	ershi	kuai		yixia
	cheap	if	about	twenty	dollar	ten-ish	twenty	dollar		under
3.	na	wo	bao	ershi kuai	yishang	(.6)	jiushi:	hai	you	
	then	1sg	insure	twenty dollar	above		precisely-CP	also	have	
4.	di-san	zeren xian	°naxie							
	3rd	liability insurance	those							
5.	(.6)									
6. K:	°un									
7.	(.3)									
8. Y:	°un									
9.	(2.4)									
10. E:	nage	wo	dou	gao	bu	qingchu				
	that-CL	1sg	all	figure	Neg	clear				
11.	(1)									
→ 12. E:	°**n ↓ ge:%** (.2)**nage**			hao	wo	juede	hao fuza		oh	baoxian
	that-CL			very	1sg	feel	very complicate		Part	insurance

Y: 'Besides, I got a more expensive insurance. If it had been for a cheaper insurance, it would be about 20 dollars, 10-ish, under 20$. Then I got a little bit more then 20$ (.6) which: also includes the 3rd person liability, and those.'
(.6)
K: '°un'
(.3)
Y: '°un'
(2.4)
E: 'That, I never figure out'
(1)
E: '°**That:%**↓(.2)**that** is very, I think it's very complicated, the insurance.'

To provide some background context for both recycling examples, in (13) A explains where she would usually go for fried chicken when she has a craving some; while in the selection of conversation in (14) Y is talking about renting a car and the insurance. The acoustic measurements of both recyclings in (13) and (14) are summarized in the following Table 4-4:

	Pitch height (Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2
Ex (13)	177-Creaky	206-H[14]	479	276	0.40	No
Ex (14)	225-Creaky	265-241	295	165	0.24	No

Table 4-4 The acoustic measurements of recyclings in Ex (13) and (14)

Based on the result described in the above table, it is shown that R2 in both recyclings is realized at higher pitch height, compared to the corresponding R1. In both cases, the end of R1 can be realized in very low pitch with the phonation of "creakiness". As for duration, in both examples their R1 is longer than R2. Note here that in both cases, the longer R1 is actually the result of a **lengthening** on the last syllable of R1. Also, after speakers finish R1 in both recyclings, there is a silence of over 0.2 seconds, followed by R2. The result of loudness is not reported in the table, as there's no consistent finding. Thus the following format is proposed to summarize the sound realization described here:

(15) **[longer R1 with lengthening and a fall-to-low ending]+[significant silence]+ [R2 at higher pitch height]**

As metioned previously, this sound pattern differs from patterns 1 and 2 in that there is a significant silence following R1. Moreover, unlike patterns 1 and 2, sound pattern 3 has an obvious sound feature of a sound stretch at the end of R1, and the lengthening at the end of R1 is accompanied by a fall-to-low pitch height. Another observation is that, in terms of pitch level, pattern 3 is similar to pattern 2 in that the R2 in both patterns is realized at a higher pitch level than the corresponding R1, while pattern 3 differs from pattern 1 in the relative pitch height between R1 and R2 of the recycling. One question here is if the sound stretch in a fall-to-low pitch may serve any function in the interaction among speakers. In next section I try to provide some explanation for the possible interactional function of this sound pattern.

4.3.2 Interactional function of pattern 3

If we turn to the recyclings in (13) and (14) again, they both involve repetitions of the Mandarin distal demonstrative *nage* 'that'. In (13) A starts in line 1 by discussing what she ate the day before, and the topic carries on to the utterance in line 4, where the turn is abandoned after the verb *zhao* 'to look for'. Then A produces an explanation of what she would usually do when she craves for some fried chicken. Towards the end of the turn in line 5, A recycles the distal demonstrative *nage* 'that' right after the verb *qu* 'to go'. Based on the syntactic structure and context of the TCU-so-far, it is expected that main verb *qu* 'to go' at the end of line 5 would

project some sort of nominal reference, most likely in referring to a place or certain location. Instead of providing an actual nominal reference, however, A produces the distal demonstrative *nage* 'that', which functions as a *placeholder*[15] (cf. Hayashi and Yoon 2006) to hold the turn-so-far, so as to give the current speaker some more time to come up with the NP in search.

The recycling in (14) is again of the distal demonstrative *nage* 'that'. Here in lines 1 to 4 by Y, the speaker talks about her experience of renting a car. Y suggests in these lines that the insurance for renting a car is not as expensive as what others might think. In line 6, the other interlocutor K acknowledges this statement by Y, and Y in return uses the same reactive token 'un' as a confirmation device in line 8. Afterwards, the 2.4-second long pause in line 9 implies that this sequence of talk might have reached its completion. Speaker E, however, revives the topic by providing further reflection on the topic concerning car insurance. Interestingly, E starts this "postmortem" (cf. Schegloff 2007) in line 10 by a topicalized demonstrative *nage* 'that', which could be ambiguous as it could refer to either the process of renting the car or getting the insurance being too complicated for herself to figure out. What follows this postmortem by E then is another one-minute silence. Since none of the participants self-selects for the next turn, E picks up the turn and starts again in line 12 with a recycling of the distal demonstrative *nage* 'that'. This recycling of *nage* 'that' is adopted in place of the subject

referent and thus also functions as a *placeholder* (cf. Hayashi and Yoon 2006). E even abandons the turn she just initiated after the adverb *hao* 'very' in line 12. Then she continues the turn with another self-repair and finally, a post-positioned NP to clarify that she actually meant by the demonstrative *nage* 'that' at the beginning of line 10 to refer to *baoxian* 'insurance'. Thus the demonstrative *nage* also functions to delay the next item due and provides additional time for accomplishing a word search.

From this discussion it is clear that these two recyclings of *nage* 'that' in (13) and (14) function as *placeholders*, which reflects some type of lexical retrieval problem during utterance production (cf. Hayashi and Yoon 2006). In addition to the evidence from syntactic construction and context, here the specific *word search* function of these two recyclings can be correlated with their *sound realization*. Before providing further evidence that the sound pattern 3 could be used by Mandarin speakers for the function of *word search*, I turn to the following examples with recyclings that are realized in the same pattern but on a different lexical item, *jiushi*[16]:

(16) AU-051-sgr-029

1.	K:	na	wo	xiangshuo:		wo	na	shihou	jiu	you	wen	wo	jie	
		then	1sg	think-say		1sg	that	time	Adv	have	ask	1sg	older sister	
2.		wo	jiu	shuo	qiguai	ta[m]=								
		I	Adv	say	strange	3pl								
3.	A:						[un]							

4.	K:	=weishenme	shi (.)	bu shi	zai	department	xiamian	shi	yige		
		why	CP	Neg CP	Prep	department	under	CP	one-CL		
5.		language center	[na:]								
		language center	then								
6.	A:		[un]								
→ 7.	K:	˙hh	tingshuo	nage	language center	**jiushi**:: ↓ (.3)	**>°jshi<**	fuze			
			hear-say	that-CL	language center	then-CP	then-CP	in charge of			
8.		suoyou	on campus	suoyou	yuyan	de	kecheng				
		all	on campus	all	language	Nom	course				

K: ‘then I thought: then at that time I asked my sister, I just said, (it’s) strange, [th-]=’
A: ‘[un]’
K: ‘=why is (.) isn’t (it) under a department, (but it) is (under) a language center? [Then]:’
A: ‘[un]’
K: ‘˙hh (I) heard that, the language center **then is::** ↓ (.3) >°**then is**< in charge of all language courses on campus.’

(17) AU-03-sgr-037

1.	S:	·hh	wo	jiu	juede	na	jiang	ni	dou	meiyou	chengzan
			1sg	just	feel	then	this	2sg	all	Neg-have	pay compliment
2.		yixia	ma:: ( )	wo	jiu	jue-	ta	[zhiyou]	shuo		
		once	Q	1sg	just	feel-	3sg	only	say		
3.	K:							[·hh]			
4.	S:	·hh	ho	suoyi	nai ban	chu le		yige	hen	da	de wenti
			Ex	so	that class	have-Asp		one-CL	very	big	Nom problem
→ 5.		**jiush↓i:** (.6)	**>jiushi<**	yinwei	[[(.)			women	shi-]]		
		then-CP	then-CP	because				1pl	CP		
6.	K:					[[un]]					
7.		(.2)									
8.	S:	dengyu	shi	a-side	gen	b	b-one	ba	ranhou-		
		equal	CP	a-side	and	b	b-one	Part	then		
9.		(.2) >biancheng<shuo		b-one	tamen			dou	xie-bu-chulai		
		become-say		b-one	3pl			all	write-Neg-RC		

S: ‘·hh then I just felt that, like this, why didn’t you pay some compliments? ( ) I just felt- she [only] said-’
K: ‘[·hh]’
S: ‘·hh ho! so there was a huge problem with that class, **then (it) was:** ↓(.6) >**then (it) was**< [[because we were-]]’
K: ‘[[un]]’

```
     (.2)
S:   'there were A-side and B, (it was) the B-one (class). And then-
     (.2) (it) >turned out< that (students in) B-one, they couldn't
     write at all.'
```

The acoustic measurements of the recyclings in (16) and (17) are presented in the following Table 4-5:

	Pitch height (Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2
Ex (16)	214-Creaky	H-313	486	191	0.35	No
Ex (17)	198-175	294-322	395	202	0.61	No

Table 4-5 The acoustic measurements of recyclings in Ex (16) and (17)

From the table above, we can see that the sound realization of these examples fits the prosodic pattern 3 [longer R1 with lengthening and a fall-to-low ending]+[significant silence]+ [R2 at higher pitch height] described earlier. Although the R1 of the recycling in (17) is not realized in an extremely low pitch height such as falling to creakiness, there is still a falling pitch in the second syllable of R1. The F0 characteristics of the recycling in (17) are given in the following figure:

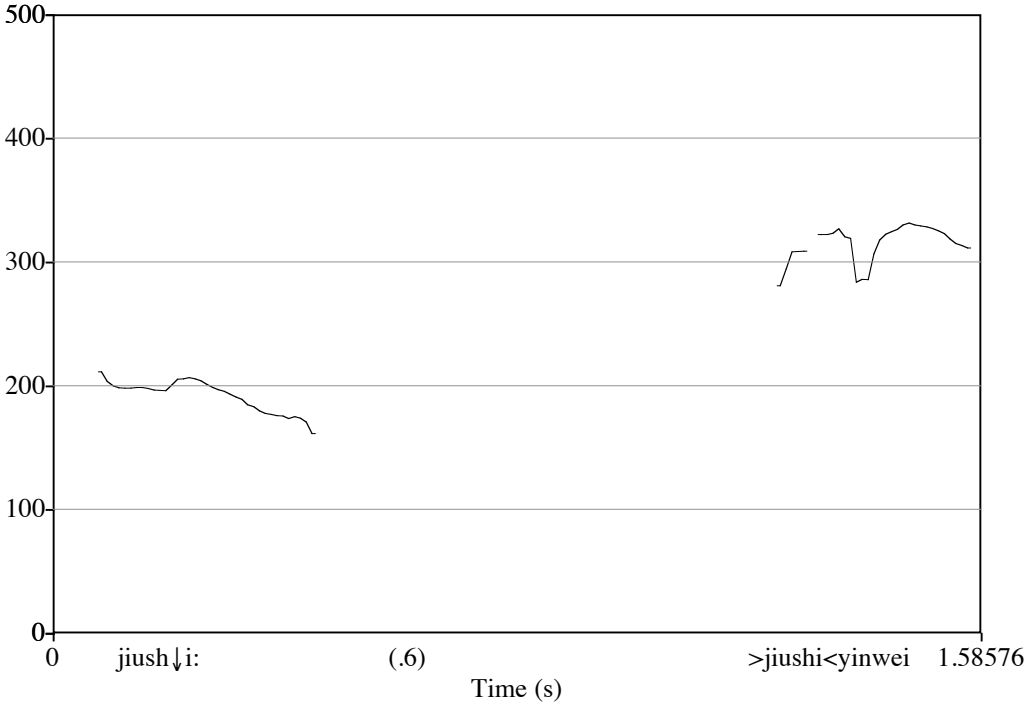

Figure 4-1. Fundamental frequency for the recycling in Ex (17)

In this recycling, the second syllable in R1 has a stretched ending, and the ending is realized in a gradual fall.

In examples (16) and (17), both recyclings are initiated in a different lexical item from the recyclings in (13) and (14), namely *jiushi* 'then is'[17]. In (16), *jiushi* 'then is' follows a noun phrase, i.e. 'language center'. What K produces after the recycling provides further *clarification* regarding the NP before the recyclings, i.e. the predicative phrase after the recycling explains the role of the 'language center'. In this case, *jiushi* 'then is' serves as a *connecting expression* to join a second constituent that introduces further elaboration on something that has

undergone discussion in the context before the connecting expression (cf. Biq 2001). In (17) the recycling of *jiushi* 'then is' also follows a NP *yige hen da de wenti* 'a huge problem' in line 4. After the recycling in line 5, S starts to explain what the 'problem' is, via another clause initiated by the connectives *yinwei* 'because'. A slight difference on the functional side of the *jiushi* 'then is' in (17) is that here it serves as a *filled pause*, as this *jiushi* 'then is' could be left out of the conversation without distorting the meaning that the speaker had intended to convey (cf. Biq 2001). In this case, the *jiushi* 'then is' in the recycling is semantically reduced from its canonical meaning with a copula sense to an *interactional* function of *floor holder* (cf. Biq 2001).

Therefore, the four recyclings of either *nage* 'that' or *jiushi* 'then is' above share similar *interactional* function of doing word or content search, and speakers use the demonstrative or connective to hold the turn-so-far, or to gain more time to come up with the following word or content in search during the production process. Even more appealing evidence can be found in that fact that, if we turn to the sound realization of these recyclings, in order to hold the turn-so-far to come up with the word in mind or specific information regarding the NP just mentioned, the current speaker may utilize these place holders such as *nage* 'that' or *jiushi* 'then is' in recycling, with specific sound realization such as a lengthening at the end the R1, followed

by a significant pause, then a repetition of the same floor holder. When the recycling with this specific sound pattern has provided enough time for the speaker to come up with the precise word or specific content for the next bit of conversation, the speaker then will be able to continue the turn. Sometimes speakers may even "rush through" the R2 in recycling, as the notation "> <" in the recyclings in (16) and (17) suggests. This "compressed", fast production can indicate that the speaker has already come up with the exact word, and is getting to the point they'd like to convey. This could also explain why the repairing segments in the recyclings are relatively shorter than their repairable counterparts.

It is thus suggested here the sound pattern [longer R1 with lengthening and a fall-to-low ending]+[significant silence]+ [R2 at higher pitch height] can be used by Mandarin speakers in the conversational context of *word search* or *content search*. One additional note on the falling pitch at the end of R1 in these recyclings is that this falling in pitch could bear further *interactional* functions. Since the falling of pitch is at the end of R1, followed by an audible pause and then R2, this falling pitch shouldn't be taken as serving the same function as falling pitch at the end of a TCU in denoting the finality of a turn. Actually, as stated above, these recycling examples are used for the purpose of *word* or *content search*, which implies that there is additional information being planned and the information will be projected after the recycling.

Thus instead of signaling the completion of a turn, the falling pitch at the end of the repairable segment in the recycling may be associated with the specific interactional function of *content planning* or *word search*.

A count of recycling examples in the aforementioned pattern 3 for *word* or *content search* function from our recycling corpus shows that there are at least 12 recycling examples realized in this sound pattern for such interactional function. There are, however, at least 11 more recycling examples realized in the sound pattern similar to pattern 3, but without an obvious falling pitch at the end of the R1. One question here is if the fall-to-low sound feature makes two distinct sound patterns, or these examples can be viewed as realized in a *sub-pattern* to pattern 3. As mentioned in Section 3.3, Chapter 3, in this study I take patterns that are associated with similar interactional function as *sub-patterns* with each other. In the following I will focus on whether instances in pattern 3 but without the fall-to-low ending in R1 should be considered as a sub-pattern or a separate sound pattern. Moreover, there are at least 8 recyclings realized in a sound pattern that also resembles pattern 3 but without significant silence between R1 and R2. I will turn to these recycling examples next.

4.3.3. Sound variations of pattern 3

First of all, consider the following:

(18) CA-02-Sgr-01-1

1.		((C sighs))											
2.	H:	(2)	buyao	tanQI	((laugh))								
			Neg-Aux	sigh									
→ 3.	C:	buyao	tanqi	wo	juede::	wo	juede::	**wo:**% (.6)		**wo**	xianzai		
		Neg-Aux	sigh	1sg	feel	1sg	feel	1sg		1sg	now		
4.		hen	huaiyi	wo	youmeiyou	keneng	nadao::	boshi	nianwan				
		very	doubt	1sg	have-Neg-have	possibility	get-RC	PhD	study-RC				
5.		zheyang	wo	juede	wo	mei	name-	meiyou	xinxin				
		like this	1sg	feel	1sg	Neg	that	Neg-have	confidence				

C: ((C sighs))
H: 'Don't sigh!' ((laugh))
C: 'Don't sigh. I feel::: I feel::: I:%(.6) I now wonder if there were any possibility that I would get:: Ph.D and finish the study, like this. I feel I'm not that- don't have the confidence'

(19) AU-03-Sgr-032

1.	S:	[ranhou]	>fanzheng<	jiu	taiduo	nazhong	dian	ma				
		then	anyway	just	too many	that-CL	point	FP				
2.	K:	[·hh]										
3.	S:	xiang	wo	jiu	juede	shuo::						
		like	1sg	just	feel	say						
4.	S:	xiang	ta	>meic<		>dou	zai<	ta	na shihou:		nai tian	ta
		like	3sg	every time		all	Asp	3sg	that time		that day	3sg
→ 5.		jiu	hui	yizhi	shuo::	**shei::** (.6)		**shei** >jiao		d	hen<hao	
		just	Aux	keep on	say	who		who	teach	Nom	very well	
6.		°shenme	shenm	de	ranhou-							
		what	what	Nom	then							

S: '[then] >anyway<, (there are) just too many points,'
K: '[·hh]'
S: 'like, I just feel that:'
S: '(It's) like, >every time< she >would be<, at that time: on that day she would just keep on saying: **someone**::(.6) **someone** >teaches very< well, etc. etc., and then-'

The acoustic measurements of the recyclings in (18) and (19) are presented in Table 4-6:

	Pitch height (Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2
Ex (18)	194	210	231	103	0.6	no
Ex (19)	162	190	482	275	0.6	no

Table 4-6 The acoustic measurements of recyclings in (18) and (19)

As shown in Table 4-6 above, the acoustic measurements of these two recyclings mostly follow the pattern 3 described in (15). Moreover, from the transcription of (18) and (19), we can see that R1 in both cases are realized with lengthening. Here if we compare these two recyclings with the four from (13) to (17) for the *word* or *content search* function, the major difference in the sound realization lies in if there's a fall-to-low pitch at the end of R1. The pitch contour of each recycling in (18) and (19), is provided in Figure 4-2 and Figure 4-3 below:

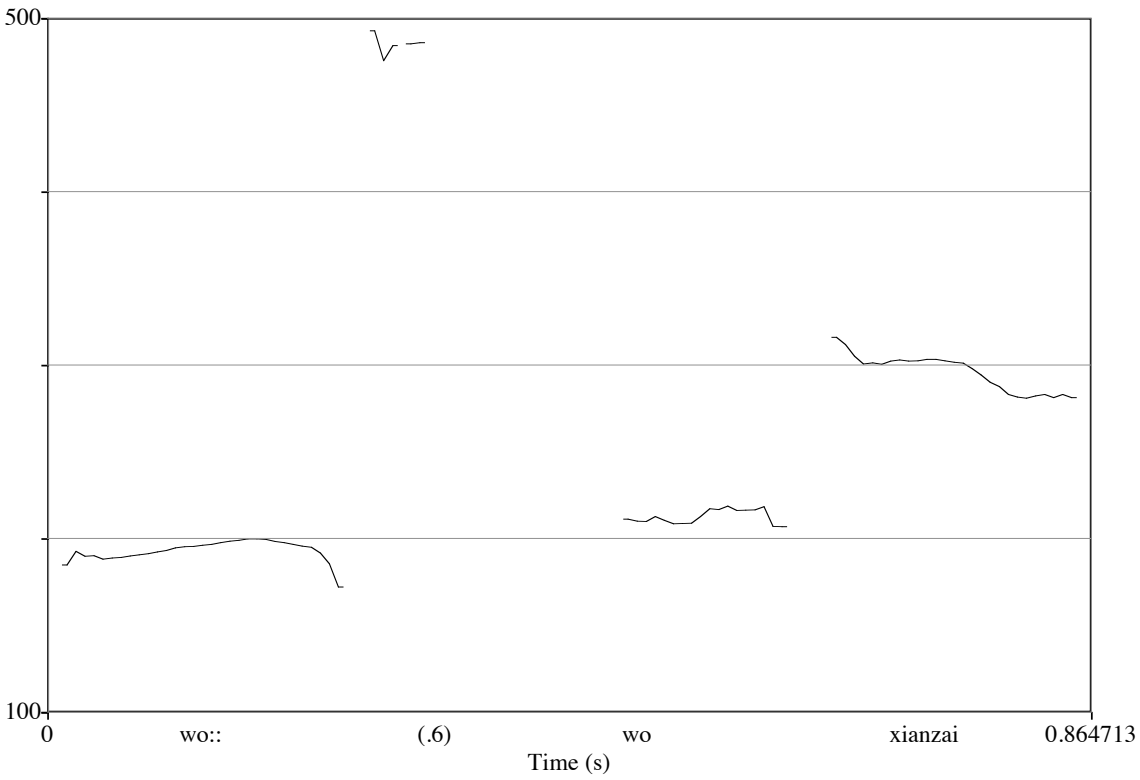

Figure 4-2. Fundamental frequency for the recycling in Ex (18)

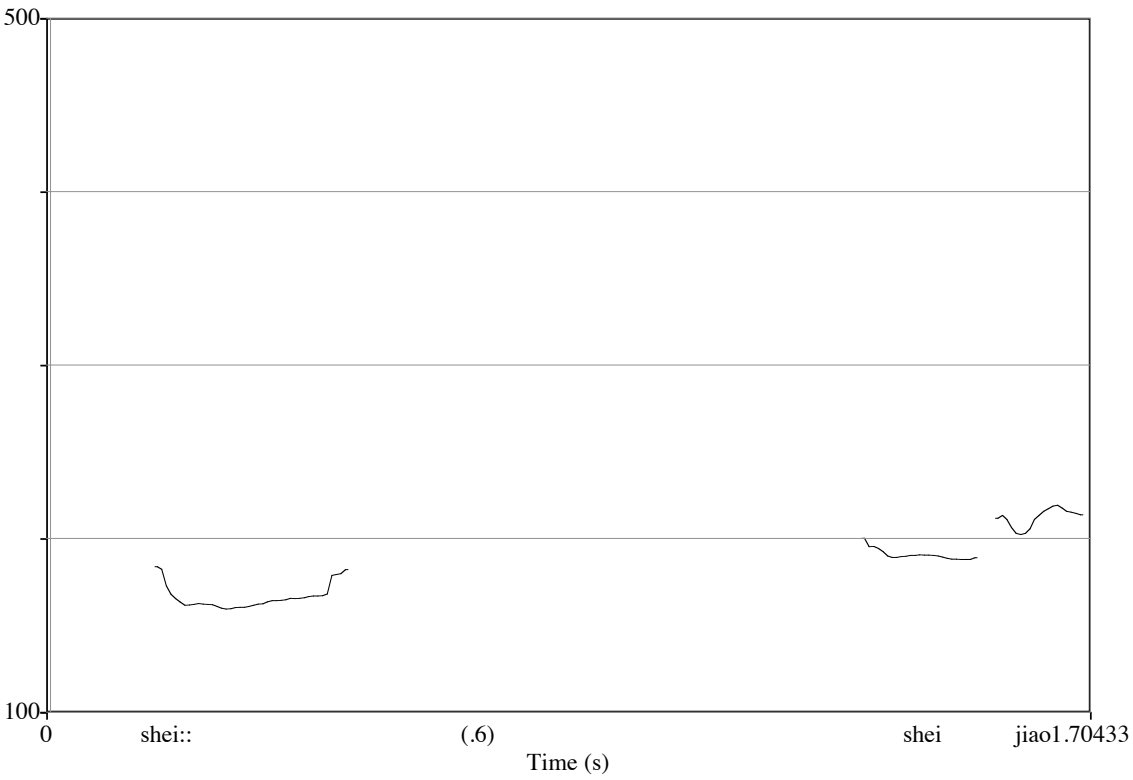

Figure 4-3 Fundamental frequency for the recycling in Ex (19)

As shown in these figures, the ending of R1 in both cases is not realized with a sharp falling F0, compared to the falling pitch contour accompany the sound stretch at the end of R1 in example (17) above[18]. Moreover, with regard to the function of the recyclings in (18) and (19), neither of the lexical items is utilized as a filler or placeholder. The recycling in (18) is on a personal pronoun *wo* 'I', which follows another recycling of *wo juede* 'I feel'. The segment of conversation in (18) is actually taken from the very beginning of a transcription, in which C initiates this section of conversation by the action of sighing. H reacts to C's action by

suggesting 'don't sigh' with a laughing quality in line 2. Then C repeats H's suggestion in line 3, and starts to provide justification for her "sighing" action. While providing the explanation, C is experiencing some production problem, with the lengthening on both the R1 and R2 in the recycling of *wo juede* 'I feel', as well as another lengthening on R1 of another recycling of *wo* 'I'. These lengthenings could reflect the current speaker's hesitation and trouble in providing a personal account of the up-coming issue. Thus unlike the distal determiner *nage* or *jiushi* which serve as placeholders in the earlier recycling examples, the recycling of *wo* 'I' here is not really in place of another constituent and not designed to hold the turn for searching the following word in the turn-so-far.

The recycling in (19), in contrast, is initiated in the question word *shei* 'who'. Prior to this segment of conversation S was complaining to K about how her hard work in teaching Chinese to kids at Chinese school was not appreciated at all. In lines 4 and 5 the 3rd person pronoun *ta* refers to the principal of the Chinese school, and here S talks about how the principal pays compliments to some other teachers but not to S. When citing the content of the compliment, S uses *shei* 'who', which does not function as a question word, but as some type of cover term so as to avoid directly mentioning the specific person S might be thinking of. The lengthening then could reflect S's hesitation in providing the specific referent that has been complimented by

the school principal. In sum, though neither recyclings in (18) and (19) are used for the function of *word* or *content search*, both recyclings share the similarity in that they involve production problems in the process of presenting certain "delicate" actions

The recyclings in (18) and (19) with the sound pattern [longer R1 with lengthening]+[significant silence]+ [R2 at higher pitch height], therefore, seem to function differently from (13) to (17) for the *word* or *content search* function. This finding provides further evidence for the previous argument that the falling pitch at the end of R1 in recyclings from (13) to (17) may carry specific interactional function, in this case for the function of word or content search. One question, however, remains to be addressed: should this sound variation without a falling-to-low R1 be taken as a separate sound pattern from the earlier pattern 3?

Although recyclings realized in these patterns seem to exemplify slightly different interactional functions, the two functions do share some properties. Actually, if we return to (14) and (17), the recycling of the distal determiner *nage* in (14) is used in the context when the speaker is expressing her own assessment about the topic of "insurance", while the recycling of the connective *jiushi* in (17) qualifies what the "problem" was with the class the speaker is talking about. Given a shared context of providing an account or assessment to some personal issues or problems, it is thus suggested that the *lengthening* at the end of R1 in these recyclings

could carry specific function of reflecting the hesitation from the current speaker in providing such personal account or assessments on certain personal issues or problems, or under the situation of performing a delicate action.

Based on this discussion I preliminarily suggest treating this variation [longer R1 with lengthening]+[audible silence]+ [R2 at higher pitch height] as a **sub-pattern** to sound pattern 3. The claim is based mainly on the similarity in the function reflected in these sound patterns, as well as the almost similar sound realizations. After all, the action of word or content search can occur in cases when the interlocutors encounter a delicate situation in which they have to make further assessment or comment on.

Now turning to a second variation to pattern 3, consider two more examples in the following (20) and (21): in (20), S is describing her teaching style to K; in (21), before line 1, K has informed A that the department where A graduated from has a job opening for an instructor position:

(20) AU-03-Sgr-042

1.	S:	keshi	wo	meiyou	banfa	shuo	biru		xiang	J	huoshi:	
		but	1sg	Neg-have	way	say	for example		like	PN	or	
2.		X	jiang	>pirushuo<	·hhh	wo	meitian	dou-	shangke	yding		
		PN	like this	for example		1sg	everyday	all	have class	must		

3.		yao jiao jiyujihao	
		Aux teach which-month-which-day	
4.		(1.5)	
→ 5.	S:	jiandande shuo [xiang wo] zheci shangke::(.2) **wo jishi**↓:: (.) **wo** >**jiushi**<=	
		simply say like 1sg this-CL in class 1sg precisely-CP 1sg precisely-CP	
6.	K:	[un]	
7.	S:	=jiao::: (.2) ni jiao shenme mingzi	
		teach 2sg call what name	

S: 'but I haven't figure out a way, like what J or: X does,>for example<, ·hhh everyday I- in every class I must teach (the phrase) "what day is today?'
(1.5)
S: 'simply speaking, [like] this time in class::(.2) **I just**↓:: (.) **I** >**just**<='
K: [un]
S: '=taught (them) "what's your name?"'

(21) AU-041-Sgr-017

1.	A:	tamen xianzai zai zhao shenme ah ·hh wo zhidao ↑tamen	
		3pl now Asp look for what FP 1sg know 3pl	
2.		xianzai zhao shenme ·hh keshi tamen xianzai zhao de	
		Now look for what but 3pl now look for Nom	
3.		shi yao ESL duibudu[i]	
		CP want ESL right-Neg-right	
4.	K:	[dui] dui dui haoxiang shi	
		right right right seem CP	
→ 5.	A:	dui ah **wo zhidao:: >wo zhi(d)ao<** shei yao zou:↓	
		right Part 1sg know 1sg know who Aux leave	
6.	K:	oh::[::]:	
7.	A:	[yinwei] wo zhiqian wo jiu zhidao ta shi women de	
		because 1sg before 1sg just know 3sg CP 1pl Nom	
8.		jiushi ESL program de Supervisor	
		precisely-CP ESL program Nom Supervisor	

A: 'What are they looking for now? ·hh I know what ↑they are looking for now. ·hh But what they want to look for now is an ESL (instructor), [right]?'
K: '[yes], right, right, (it) seems to be.'
A: 'yes, **I know**:: >**I know**< who is leaving:.'
K: 'oh:[::]'
A: '[be]cause earlier I just (got to) know that it is our, precisely that's the supervisor of our ESL program.'

The acoustic measurements of the recyclings in (20) and (21) are summarized in Table 4-7:

	Pitch height (Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2
Ex (20)	175-201-199	203-261-278	504	314	<0.2S	No
Ex (21)	233-299-306	262-312-348	667	285	<0.2S	No

Table 4-7 The acoustic measurements of recyclings in Ex (20) and (21)

According to Table 4-7, the acoustic measurements of both recyclings in (20) and (21) in general follow the pattern 3 described previously in (15), but with one exception. In both cases the R2 of the recycling follows direct after R1. Note here both recyclings are inititated by a "sound stretch" (cf. Schegloff 1979), that is, a lengthening of the final sound of R1.

The recycling in (20) is done on a phrasal combination of 1st person singular pronoun *wo* plus the lexical item *jiushi* 'then is'. On the function side, starting in line 1 of this section of conversation, S is explaining how her teaching style is different from other teachers at the Chinese school. After making the comparison, the conversation comes to a long pause of 1.5-second without any uptake from either speaker. Then in the next turn S proceeds by explaining how she usually teaches. Here S tries to provide a concrete example to explain her teaching style. While coming up with exactly what she has taught during a recent class, S seems to encounter some production problem, which is reflected in the sound stretch of word *shangke* 'to teach the class', followed by a 0.2-second pause prior to the recycling. The

lengthening in the R1 of the recycling, therefore, seems to indicate that S is still in the process of coming up with the content of the example. Further evidence of this long process of holding the turn for *content search* can be substantiated by another lengethening at the verb *jiao* 'to teach' located after the recycling.

As for the recycling in (21), it has been introduced earlier that both speakers have been discussing information about a job opening at the department where A graduated from. In line 1 A first poses a question to check what kind of vacancy has been posted in the job announcement, and then answers the question herself, followed by another question searching for confirmation about if the opening is for an ESL instructor. In the next turn K confirms that it seems to be the case. Then in the following turn, A uses the recycling repair of *wo zhidao* 'I know' to hold the turn in order to gain more time to come up with what she actually knows. Another plausible explanation to the lengthening at the end of *zhidao* 'to know' is that, the speaker may be *hesitating* in sharing the information of exactly what she knows about the situation. Eventually in the following turn in lines 7 and 8, A states that the reason behind the job opening is due to that the supervisor of the ESL program is planning to leave the position.

From the above discussion, therefore, it seems that both recyclings serve the function of holding the turn to come up with the next bit of conversation. At least the sound stretch at the

end of R1 may reflect the turn holding function. Some additional places to note is that, for the recycling of the phrasal combination *wo jiushi* 'then I am…' in (20), there is actually a falling pitch contour accompany the sound stretch, which is one of the sound feature of pattern 3 for the function of word or content search described in Section 4.3.2. Although the recyclings in (20) and (21) are realized in a sound variation that differs from pattern 3 in that there's no extra pause between the R1 and R2, the recyclings are still used for a similar function of holding the turn for planning of the following content. Based on the shared function, it is suggested here to also treat the second sound variation as a **sub-pattern** to pattern 3. In other words, when the recycling involves the function of word or content search, there may be a longer pause in between R1 and R2 to win extra time for searching, but the pause is not necessarily required.

In addition to identifying the sound variation without additional pause in between R1 and R2 as a **sub-pattern**, two more points are worthy to be pointed out. For one, if we turn back to the recyclings in (20) and (21), one more shared sound feature from these recycling examples is that the R2 in both cases has been "rushed through" (marked by the convention "> <" in the transcription). Similar sound feature has been identified in the recyclings in pattern 3 discussed earlier. As suggested in Section 4.3.2, the feature of "compressed" R2 may be due to that the speakers have come up with the next bit of conversation and is hurry getting into the point they'd

like to convey.

Another point not related to the sound manifestation of the recyclings but worthy pointing out is, for both recyclings in (20) and (21), they involve repetitions of a phrasal combination of personal pronoun plus an adverb or verb. So far the recycling examples in patterns 1 and 2 discussed in the current chapter mostly involve repetitions of monosyllabic or disyllabic lexical items. Some of the lexical items in the recyclings belong to the lexical category of function words (i.e. recyclings of personal pronouns in pattern1 or pattern 2), while some are of the content words. On the other hand, the recyclings in main pattern 3 discussed in Section 4.3.2 involve repetitions of function words or lexical item that has undergone the process of grammaticalization. Here with recycling examples such as those in (20) and (21), they shows that the scope of Mandarin recyclings can extend to some larger constituents. Some interesting questions to explore further are, for one, the implications of the speakers' choices of recyclings that incorporate a scope beyond the constituent of wordhood. Moreover, as some of the recyclings in pattern 3 involve words that have undergone grammaticalization, another question is if the grammaticized meaning of these lexical items also contribute to the interpretation of the interactional function of the repair, on top of the sound patterns in the recyclings. As the current study focuses on the interrelationship between sound patterns in recyclings and their

interactional function, further study could be carried out how the meaning and grammatical function of such constituent contribute to the motivation behind the execution of recycling on such lexical items and/or phrasal units.

4.3.4 Section summary

In this section I first identified sound pattern 3 as [longer R1 with lengthening and a fall-to-low ending]+[significant silence]+ [R2 at higher pitch height]. Several recyclings involved in this sound pattern were carried out on specific lexical items such as the distal demonstrative *nage* or the word *jiushi*. It was further suggested that the recyclings in sound pattern 3 with a falling pitch at the end of R1 can carry the function of *word* or *content search*. Then I also discussed some additional recycling examples realized in different sound variations from pattern 3. It is shown that the variation [longer R1 with lengthening]+[significant silence]+ [R2 at higher pitch height] may be used in recyclings for the action of introducing a delicate situation. A second variation [longer R1 with lengthening]+[R2 at higher pitch height] is found in reyclings that function to hold the turn-so-far. It is suggested that these variations can be considered **sub-patterns** to pattern 3.

4.4 Pattern 4

So far in this chapter, 3 sound patterns have been introduced, and each associated with a distinctive interactional function. In this section I present the fourth prosodic pattern, which still shares the common prosodic feature of longer R1 with the previous 3 patterns. The main difference in the sound realization of the following recycling examples lies in the relative pitch height between R1 and R2. In Section 4.4.1 the sound pattern will be identified. Section 4.4.2 provides further analysis of the interactional function correlated with pattern 4. In Section 4.4.3 I turn to additional **sub-patterns** that are presented as sound variations to pattern 4, along with their interactional functions. Section 4.4.4 is the section summary.

4.4.1 Pattern 4: **[longer, higher R1 with lengthening]**

To establish sound pattern 4, consider examples (22) and (23):

(22) AU-051-Sgr-013

1.	A:	ran:hou:	(.3)	° yao	chi	hanguocai		ma	haojiu	mei	chi	[le::]		
		then		Aux	eat	Korean food		Q	long time	Neg	eat	FP		
2.	K:											[oh]		
												Ex		
3.		dui	ah:	yinwei	nabia%	yinwei		nabian	you-	nabian		fujing	you	
		right	Part	because	there	because		there	have	there		nearby	have	
4.		nazhong		[[˙hh]]	jiushi		hen	xiang	nazhong					
		that-CL			precisely-CP		very	like	that-CL					
5.	A:			[[un]]										
6.		(.6)												

→ 7.	K:	yinggai	shi	nazhong	hanguo:: (.)	**wo: >wo** zhidao<			pangbian	shi	
		should	CP	that-kind	Korean	1sg	1sg know		nearby	CP	
8.		chi	nazhong	han%	(.6)	xiang	nazhong	jiachangcai		nazhong	
		eat	that-kind	Korean		like	that-kind	home cooking		that-kind	

A: 'and: then: (.3) °to eat Korean food? (I) haven't had (Korean food) for a while[::].'
K: '[oh::] right: because there% because there are- around that place there are that kind [[˙hh]] it's just like that kind'
A: '[[un]]'
(.6)
K: '(It) should be that kind, Korean: :(.) **I: >I** know< by the place there's a restaurant for that kind of Ko% (.6) like home-made type (of food).'

(23) AU-012-Sgr-008

1.	E:	ranhou	da dianhua	guoqu	na	jiudianduo				
		then	make phone call	DC	then	around 9:00				
2.		(.6)								
3.	E:	ei	bu-dui%	badian	(.)	ta	shuo oh:	keneng	jiudian	shi:-
		Ex	Neg-correct	8:00		3sg	say Ex	probably	9:00	10-
4.		bu%	ta	benlai	shuo:	en	keneng	jiu%<		
		Neg	3sg	originally	say	Ex	probably	nine-		
→ 5.		**kneng:**	°**kneng**	shi'erdian	ba					
		probably	probably	12:00	FP					
6.	E:	wo	shuo ha::::::↑↓	[ta	jiu	gaodao]	jiudian	shidian	zheyang	
		1sg	say Ex	3sg	then	do-RC	9:00	10:00	like this	
7.	Y:			[zenme	le]					
				how come	Asp					
8.	E:	(.3)	ban	nage	mattress					
			move	that-CL	mattress					

E: 'Then (we) called (him) over, around 9pm.'
(.6)
E: 'ei, no% around 8pm (.) He said, oh: probably, around 9, or 10:- No% he originally said: en, probably nine%< **probably: °probably** around 12.'
E: 'I said, "WHAT:::: ↑↓?" [He (didn't show up)] until 9 or 10, something like that'
Y: '[what happened?]'
E: '(.3)(to come) to pick up that, the mattress.'

In (22), both speakers are planning a trip to a nearby town to do grocery shopping in a Korean supermarket. A asks in line 1 if the trip would include having some Korean food, and K tries to explain there are indeed some Korean restaurants around the supermarket and what kind of restaurants those are. In (23), E talks about a recent phone call to a mutual friend C, and the purpose of the call was to find out when C was planning to get to E's place and pick up a mattress. The acoustic measurements of these recyclings are presented in Table 4-8 below:

	Pitch height (Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2
Ex (22)	231	216	260	157	no	no
Ex (23)	192[19]	180	282	162	<0.2	no

Table 4-8 The acoustic measurements of recyclings in (22) and (23)

The acoustic measurements in Table 4-8 demonstrate that, first of all, R1 in both recyclings is realized in a higher pitch than the corresponding R2. The measurement of duration shows that R1 in both recyclings is longer than the corresponding R2. Furthermore, the relatively longer R1 is shown in the transcription in that R1 in both recyclings have a lengthening marker ":" at the end of the last syllable. The result of measurement on loudness is not reported in the table, as there is no consistent conclusion found regarding if R1 or R2 is louder. The pattern can now be formulated as:

(24) **[longer, higher R1 with lengthening]**

After establishing the sound pattern, I will turn to a discussion of the interactional function corresponding to pattern 4 in the next section.

4.4.2 Interactional function of pattern 4

To locate the exact interactional function correlated with pattern 4, I start with the recycling in (22). As explained earlier, here K in line 2 explains to A the kind of Korean restaurants there are in the area that both speakers are planning to visit. In the process of producing this explanation, starting in line 3, K encounters several production problems, which are reflected in at least four consecutive cases of repairs, i.e. first of all, a recycling repair plus addition, changing the phrase *yinwei nabian* 'because there' to *yinwei nabian you* 'because there (it) has'; second, the phrase *nabian you* 'there (it) has' is recycled with an additional word, changing into *nabian fujing you* 'around there (it) has'. Then the next two repairs involve further elaboration on the word *nazhong* 'that kind'. The lexical item *nazhong* 'that kind' at the beginning of line 4 is followed first by an in-breath, marked by "˙hh" in the transcription, then the recycling plus addition, initiated by the connecting expression *jiushi* 'precisely is' and is elaborated to *jiushi hen xiang nazhong* 'precisely is just like that kind'. When K proceeds to line 7, after a 0.6-second pause, she produces yet another recycling with a partial replacement and comes up with the phrase *yinggai shi nazhong* 'should be that kind'. After the recycling plus replacement,

K has a long lengthening on the last syllable of NP *hanguo* 'Korean'. With a micro pause after the lengthening, K *restarts* the turn with the recycling of the personal pronoun *wo*, which is realized in sound pattern 4. Thus, before the recycling of the first personal pronoun, K has produced several repairs, one after the other. Up to the point of the micro pause right before the recycling, K has abandoned what she produced as the result of the series of repairs and then re-initiated the whole turn.

When turning to the recycling of the adverb *keneng* 'probably' at line 5 in (23), we could find a similar environment of *production problem*, up to the point before the recycling. Starting in line 1, E explains when the phone call from C took place. At the beginning of line 3, after a 0.6-second pause, E corrects herself and states that the time of the phone call was around 8pm. Moving on to lines 4 and 5, E accounts for the time C said that he would possibly be available to stop by and pick up the mattress. As can be seen, there are some uncertainties about exactly when C could stop by; he said it could be 9 or 10pm. Then there is a restart initiated by the negator *bu* 'no', which provides a correction on the possible time C would be available. In this correction, E initiates a repair to the phrase *keneng jiu* 'probably nine- (pm)' with a cut-off, then swiftly moves on to the content of the repair, which is about when C said he would be available originally. But before providing the original time suggested by C, E carries out the

recycling on the adverb *keneng* 'probably'. Thus quite similar to the recycling in (22), when locating the time of C's arrival, E displays some production problems, such as several instances of repairs, before reaching the recycling, which functions to restart the turn-so-far in order to get to the exact time of C' arrival.

Function-wise, therefore, the recyclings in (22) and (23) manifest the same function of using the recyclings to *restart* the turn, after the current speaker has encountered some production problems. When turning to the sound realization, the longer R1 at a higher pitch height can be employed by the speaker to signal the *restarting* of the turn-so-far after the struggling with the production of the turn up to the recycling. Specifically, the longer R1 may serve two functions: on the one hand, considering the lengthening at the end of R1, it could reflect the production problem by holding the turn-so-far. On the other side, from the viewpoint of turn-taking, since the speaker has produced several repairs before reaching the point of restart, the current turn could actually be vulnerable to interruption or other-initiated repair by the other interlocutors. Thus a longer R1 can otherwise reinforce the speaker's attempt to secure the turn after the series of repairs. Similarly, the higher pitch on R1 could be taken as that the speaker is attempting to *restart* something new, or signaling the projection of the following content. These explain the longer R1 at a higher pitch height for the function of *restarting the turn-so-far*.

To further the observation above, consider another recycling also in sound pattern 4[20]:

(25) AU-03-Sgr-010

1.	S:	jiu	bian	meitian	dou	zai yiqi	hh	jiu	er	gen	si				
		Adv	become	everyday	all	be together		only	two	and	four				
2.		bu hui		jian[dao mian]											
		Neg-Aux		meet-RC each other											
3.	K:				[·h	dui	ah]	biancheng		S	hui-	·hh	dadianhua		
						right	Part	become		PN	Aux		make phone call		
4.		lai	wen	wo	shuo:	>yaobuyao<		yiqi		qu	shang-	hh	-ke	[hh]	
		DC	ask	1sg	say	Aux-Neg-Aux		together		go	to class				
5.	S:													[mei]you	
														Neg-have	
6.		jiu	hen hao		ah::	qishi		meiyou	wo	qishi		benlai	jiu	juede	
		just	very good		FP	actually		Neg-have	1sg	actually		originally	just	feel	
7.		(.2)	yinwei		wmen ziji			xishang		de	(.2)	yinggai	yao	(.4)	yiqi=
			because		1pl-selves			department		Nom		should	Aux		together
8.	K:	=·H	dui	ah	qishi										
			right	Part	actually										
→ 9.		wo	hen	jiu::	w	hen	jiu	meiyou	**zai:**	(.) ◦	**zai**	xiuke	le		
		1sg	very	long	1sg	very	long	Neg-have	Asp		Asp	take class	FP		

S: 'Then (it) turns out (we are) together everyday ((laugh)) except for on Tuesday and Thursday (we) won't [see each other].'
K: '[Right], (it) turns out that you ((referring to S)) would ·hh call (me)and ask: if (I) >want to< walk to the class together. [((laughing))]'
S: '[no], (that's) good:: actually, no, actually I originally thought (.2) because we are at the same department, (we)(.2) should (go) (.4) together.'
K: '·hh right, actually I for a while: I for a while haven't been **taking: (.) ◦taking** classes.'

Before this selection of conversation, S talks about how she and K have being seen each other a lot more often this semester, as they are taking the same class, and working at the same place. In reacting to S's statement, K in line 3 initiates a direct comment and says that S even calls her

and asks to walk to the class together. As the direct comment by K is stated in a teasing tone, it could be posed as a dispreferred comment. Facing the dispreferred comment, S in lines 5 to 7 provides an account as to why she would do so. Then K follows up with the turn in lines 8 and 9 to express her reaction to S's account. In reacting to the account, K initiates the turn with *dui ah* 'right', which seems to project an agreement, or at leastsome type of alignment. But when proceeding with the turn, K actually attempts a *disalignment* and tries to distance away from S's account by stating that she 'hasn't been taking classes for a while.' Note here that in producing the disalignment, K actually does two recyclings before reaching the main point of the disalignment. The recycling realized in pattern 4 is the second recycling in this TCU: the recycling of the progressive aspectual marker *zai*, which follows another recycling of the phrase *wo hen jiu* 'I for a while'. The first recycling of *wo hen jiu* 'I for a while' otherwise reflects that the current speaker is encountering some problem, i.e. the speaker displayed difficulty in coming up with the content of the disalignment.

Again, the recycling of the aspectual marker *zai* occurs after at least another recycling in the same turn in (25). While the first recycling in the turn may reinforce the production problem as a result of providing a disaligning statement, the speaker initiates the second recycling in order to restart the turn-so-far and get to the main content of the disalignment. Based on this

observation, I suggest that pattern 4 [longer, higher R1 with lengthening] is a sound pattern used to reflect that the current speaker has undergone some substantial production problems (such as additional examples of repair) before the recycling, and the recycling signals a *restart* in order to get to the main content of the turn and keep on with the turn.

One point of comparison here lies in the recyclings realized in sound pattern 2 [longer R1 with cut-off]+[R2 at higher pitch height] and the recyclings in pattern 4 discussed here. Actually, if we consider the location of recyclings within the turn, the recyclings in (22) to (25) appear to be rather similar to the recyclings in pattern 2 (cf. the recycling in example (7)), i.e. they tend to occur later on in the turn. With regard to the sound realization, however, the recyclings in the two sound patterns differ mainly in the relative pitch height between R1 and R2. More specifically, the R2 in pattern 2 has a higher pitch height, while for pattern 4 it is the other way around with its R1 realized at a higher pitch level. Most of all, earlier in discussing pattern 2, it was claimed that the pattern with higher pitch on R2 is due to the function to *project a semantic contrast*. Here the higher pitch on R1 in pattern 4, instead, is related to *restarting* the turn as a result of production problems. Accordingly, it is suggested that the difference in a higher pitch on R1 or R2 in Mandarin recycling does serve different interactional functions. Furthermore, by comparing the two sound patterns in doing Mandarin recyclings, there is an

interesting contrast in that, while a higher pitch height on R2 can project *forward* the following content of *semantic contrast*, we have to trace *backward* to the earlier conversation to locate the reason of having a higher pitch on R1, which functions to *restart* the turn-so-far. Based on the finding, it is suggested that pattern 4 can be established as a separate pattern in the execution of Mandarin recycling repair. A further implication of the finding is that, instead of identifying one "marked" sound pattern for doing repair (cf. Tseng 2006), different sound manifestations can actually be correlated with different functions for doing recyclings.

A count of the occurrences of sound pattern 4 in the corpus demonstrates that there are at least 6 examples of recyclings in this sound pattern, with the function of restarting the turn-so-far after other instances of repairs. It should be mentioned, though, that in addition to these examples, there are another 11 instances of recyclings that were realized in similar sound pattern but with cut-offs at the end of the R1 to initiate the recyclings. In the next sub-section I will turn to these recyclings and explore further if they belong to a **sub-pattern** of pattern 4.

4.4.3 Sub-pattern to sound pattern 4: [longer, higher R1 with *cut-off*]

Consider the following two recycling examples at the arrowed lines in (26) and (27):

(26) AU-012-Sgr-009

1.	Y:	oh::	ta	zenme	le					
		Ex	3sg	how come	Asp					
2.	E:	[hai]								
		what								
3.	Y:	[(			)]					
4.	E:	ta	jiu	banjia	ah[[:]]					
		3sg	just	move	FP					
5.	Y:				[[oh]]					
6.	E:	ta	(	)	ban	qu	nabian			
		3sg			move	go	there			
7.		(.8)								
→ 8.	E:	**jie(g)uo**	**ta-**	**jieguo**	**ta**	zhende	shi'erdian	cai	lai	ban
		in the end	3sg	in the end	3sg	actually	12 o'clock	until	come	move

Y: 'oh::, what happened to him?'
E: '[what]?'
Y: [( )]
E: 'He was mov[[ing]]!'
Y: '[[oh]]'
E: 'He ( ) moved there.'
(.8)
E: **'In the end he- in the end he** actually didn't show up to move (the mattress) until 12.'

(27) CA-02-Sgr-002

1.	C:	jiao	zhongwen							
		teach	Chinese							
2.	C:	dui	ah::	[zhe	keneng	shi	yitiao	lu]		
		right	Part	this	possibly	CP	one-CL	route		
3.	H:			[(				)]		
4.		(1.0)								
5.	C:	keshi	jiu-							
		but	then							
6.		(0.9)								
→ 7.	H:	keshi	**wo% >wo**		qshi<	wo	ye	you	zai	xiang	zhege
		but	1sg	1sg	actually	1sg	also	have	Asp	think	this-cl
8.		wenti	ye							
		problem	FP							

```
C: 'to teach Chinese'
C: 'yeah:: [this could be a possible choice].'
H:         [(                    )]
   (1.0)
C: 'but then-'
   (0.9)
H: 'but I% >I actually< I have also been thinking about this problem,'
```

The sound realization of these two recyclings conforms to the pattern description [longer, higher R1 with *cut-off*][21]. Note here in both cases the recyclings have been initiated by cut-offs. As for the function of these two recyclings, in (26), the conversational exchanges between E and Y actually follow the conversation in (23), in which E talks about a mutual friend C's call to arrange the time for picking up a mattress. In line 1 Y asks a question about what happened to C. An other-initiated repair occurs afterwards in line 2, and then the base SPP is provided. After the SPP, E follows up with additional information at line 6. The utterance thus comes to possible completion and a fairly long silence ensues in line 7. The long pause is then followed by the initiation of the recycling, which is a combination of the conjunction *jieguo* 'in the end' plus the third person singular pronoun *ta* (referring to C). So the recycling can function to *restart* a "post expansion" which conveys information about exactly when C showed up eventually.

As for example (27), prior to this part of the conversation, C was talking about her concern that she wouldn't be able to find a job after getting PhD, and H suggested to find a position teaching Chinese. The utterance in line 1 by C is a repetition of the suggestion, followed by an

initial agreement to the suggestion. There is a long silence afterwards in line 4, and neither of the speaker attempts any uptake of the speakership until line 5, where C reacts with conjunction *keshi* 'but'. Although the turn-beginning conjunction could project a disagreement, C aborts the turn after the following adverb *jiu* 'then'. What follows next is another long 0.9-second pause, when C is probably formatting the disagreement while H waits for C to complete the turn. Since there's no further continuation of the turn from C, H finally takes over the speakership at line 7. This is where the recycling of the 1st person singular pronoun takes place, after the turn-initial conjunction *keshi* 'but'.

Sequentially, therefore, the two recyclings share some similarities in that they occur in turns that occur after a long pause. From the perspective of turn-taking, the significant gap in between turns shows that the conversation hasn't been following the general principle of "no gap in between transitions" in the organization of conversation proposed by SSJ (1974). Furthermore, the long pause can reflect that there are some "troubles" with the operation of turn-taking system, i.e. there is no further uptake of the conversation from any interlocutor in both cases, or the speaker of the turn prior to the long pause has been facing the trouble coming up with the following content of the conversation. So after the significant pause, the interlocutors may use the recyclings to *restart* or *reopen* the conversation again, or to pursue an

uptake of the speakership and take over the turn (i.e. example (27)).

Thus the recyclings in (26) and (27) not only are located at a sequentially crucial position, also they are actually quite similar to the recyclings in pattern 4 discussed earlier in that they all function to *restart* the turn after troubles with the conversation. As for the difference in pattern 4 and the sound variation initiated by cut-offs, there doesn't seem to be much contradiction in the fact that the recyclings in (26) and (27) are initiated by cut-offs. In terms of sound features, when the interlocutors are restarting or reopening the conversational sequence, they can rely on the longer R1 at a higher pitch to signal the action of restart. This is also the case of what has been observed with the recyclings in the main pattern 4. It is suggested, therefore, the variation [longer, higher R1 with *cut-off*] to be taken as a **sub-pattern** to sound pattern 4.

Now, consider two more recyclings in the same variation [longer, higher R1 with *cut-off*] in another sequentially significant position:

(28) CA-05-Sgr-029

1.	C:	ei-	(.7)	ta	shi-	(.)	taiwanren	>duibudui<						
		Ex		3sg	CP		Taiwanese	right-Neg-right						
2.		(1.7)												
3.	H:	ni	zenme	zhidao										
		2sg	how	know										
→ 4.	C:	↑**ta-**	**<ta**	shangguo			wo de-	ta	shi	wo	recitation	de	xuesheng	
		3sg	3sg	attend-Asp			1sg-Poss	3sg	CP	1sg	recitation	Nom	student	

5. H: oh really

C: ‘ei- (.7) He’s- (.) Taiwanese >right<?’
(1.7)
H: ‘How do you know?’
C: ‘↑**He- <he** attended my- he was a student in my recitation.’
H: ‘Oh, really?’

(29) AU-013-Sgr-030

1.	K:	ei	ni-	ni de	macbook	yinggai	sh-	ni	shibushi	nage	dual de		
		Ex	2sg	2sg-Poss	PN	should	CP	2sg	CP-Neg-CP	that-CL	dual Nom		
2.		jiushi	ni%	ni	shi	zhuang:	ni	you	zhuang	nage-	window[s]		
		precisely-CP	2sg	2sg	CP	install	2sg	have	install	that-CL	windows		
3.	E:											[> dui]	
												right	
4.		dui	dui<										
		right	right										
5.		(.9)											
6.	E:	°un											
7.	K:	jiang	buhui	pao de	bijiao	man ma							
		like this	Neg-Aux	run-Adv	more	slow Q							
8.	E:	ha											
		Q											
9.	K:	jiang	buhui	pao de	bijiao	man ma=							
		like this	Neg-Aux	run-Adv	more	slow Q							
→ 10.	E:	**=ta**	**shi-**	**>ta**	**sh**	liangge<	xitong						
		3sg	CP	3sg	CP	two-CL	system						

K: ‘hey, you- your macbook should be- is that dual (system)?
Is it that you% you installed:- you’ve installed that- Window[s].’
E: ‘[>right]
right, right<’
(.9)
E: ‘°un’
K: ‘(if it’s) like this, wouldn’t (the operating system) run slower?’
E: ‘What?’
K: ‘like this, wouldn’t (the system) run slower?’
E: **‘It is- >It is** of two< systems.’

The acoustic measurements are summarized in the following Table 4-9:

	Pitch height (Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2
Ex (28)	390	369	217	101	no	no
Ex (29)	321-301	283-281	243	189	<0.2	no

Table 4-9 The acoustic measurements of recyclings in (28) and (29)

As can be seen, the sub-pattern [longer, higher R1 with *cut-off*] can still accommodate the sound realization of the two recyclings in (28) and (29), and both are initiated by cut-offs at the end of R1.

To demonstrate how the recyclings are located at unique sequential position, here I start with the recycling in (28). The recycling in (28) is carried out on a 3rd person singular pronoun *ta*, located at the very beginning of the TCU. Note here that the utterance in line 4 is actually an answer to the question *ni zhenme zhidao* 'how do you know?' by H in line 3. When tracing further back to line 1 in this segment of the conversation, it actually starts with another question by C in line 1. In fact, the question by C forms the "base" first pair part (FPP) of the adjacency pair (cf. Schegloff 2007). In replying to C's question if the person under discussion is from Taiwan, H doesn't answer directly but steers the conversation back to C by the question *ni zhenme zhidao* 'how do you know?' As result, the FPP and SPP in lines 3 and 4 actually serve as an *insert expansion* to the base adjacency pair[22]. Thus the recycling in line 4 functions to initiate the SPP in the insert expansion.

When turning to (29), the recycling of the phrase *ta shi* 'it is' is located at the initial position of a *second pair part*. The base FPP is in line 7, where K initiates the question about if the computer would be slowing down with two systems installed. Then the next two turns form the *insert expansion*, in which E incorporates an other-initiated repair to request for a clarification, and K repeats the question again in line 9. Finally the answer is provided in line 10. Here the base SPP is initiated by the recycling of the phrasal combination that consists of 3rd personal pronoun *ta* plus the copular *shi*.

Sequentially, therefore, both recyclings occur at the beginning of a SPP and function to initiate the SPP. Though there is slight difference in that one initiates the SPP in the base adjacency pair and the other the SPP in the insert expansion, they share the similarity in that, before reaching the SPP, there is some "trouble" with the sequential organization of the adjacency pair, namely the inserted sequence. In other words, the recycling initiates an SPP that is not in an adjacent turn to the FPP. From this perspective, a plausible account is that the interlocutors in both examples have encountered some troubles with the sequence after the FPP, and they make use of the recycling to initiate the SPP after the trouble with the turn-taking sequences. Moreover, in terms of sound, the speakers initiate the recyclings at the beginning of the SPP with a longer R1 at a higher pitch, so as to highlight the initiation of the SPP after the

trouble in the sequence. Note here the initiation is done by the cut-off at the end of R1, and the cut-off could also prompt a quicker restart after the initiation of the repair (cf. Jasperson 1998). This is further evident by a jump-start from R2 to the following syllable in (28), and in (29) the faster speech rate starting from R2 to the following lexical item after R2.

Based on the above observation, it is suggested that the recyclings of (28) and (29) in the sound variation [longer, higher R1 with *cut-off*] could still be considered as realized in a **sub-pattern** to pattern 4. Though the recyclings of (28) and (29) occur in the rather special sequential position of SPP, before the initiation of the repair, there is some trouble with the sequential organization after the base FPP, namely the insert expansion. When the interlocutors reach the point of the beginning of the SPP, they incorporate the longer and higher R1 with the cut-off to initiate the recycling and then getting to the content of the SPP. Thus pattern 4 and its sound variations share the similarity in that the recyclings of either sound format occur after a certain type of "trouble", i.e. trouble with the production of the turns, or the sequential organization of the turns. It is based on this similarity in the function that the claim about the relationship between the sub-pattern and the main pattern is established.

4.4.4 Section summary

To summarize, in this section I started with sound pattern 4 [longer, higher R1 with lengthening], and it was found that the pattern is realized in some Mandarin recyclings that follow some production problems, such as additional instances of repair before the recycling. It has been interpreted that the lengthening at R1 of these recyclings could gain speakers some more time to project the *restarting* of the following turn about the current topic. The initiation of new start is also reflected in that the R1 is at higher pitch height. In addition to sound pattern 4, a sub-pattern [longer, higher repairable segment with *cut-off*] was identified. Some recyclings realized in this sub-pattern were located at the sequential position of second pair part, but not all recycling examples in the sub-pattern occur in the SPP. It is based on the similar function of initiating a *restart* that I suggest taking the sound variation with cut-off at the end of R1 as a sub-pattern to pattern 4.

4.5 Pattern 5

In this section I present the last prosodic pattern that has longer R1 as the 4 sound patterns introduced previously. In Section 4.5.1 sound pattern 5 will be identified. Section 4.5.2 identifies the interactional function corresponding to pattern 5. Section 4.5.3 focuses on the comparison between the current sound pattern with other patterns identified earlier, namely

pattern 3 for the function of *word* or *content search*. Section 4.5.4 is the section summary.

4.5.1 Sound pattern 5: **[longer R1]+[shorter R2 falling within the pitch range of R1]**

To start with, consider the recycling examples in (30) and (31):

(30) AU-013-Sgr-013

1.	Y:	mai	ge	shenme	chi	de	ah	Guaiguai	yaobuyao	
		buy	CL	what	eat	Nom	FP	PN	Aux-Neg-Aux	
2.		(.7) ((sound of breathing))								
3.	K:	(.3) ˙hh								
4.		(1.8)								
5.	E:	xiangbudao		Taiwan	you	[shenme	hao%]			
		think-Neg-RC		PN	have	what	good			
6.	Y:					[tiedan	na]			
						iron egg	FP			
→ 7.	E:	°tie	**na**	**keyi%↓**	**>na**	**key<**	dai	ma	na	dong-
		iron	that	Aux	that	Aux	bring	Q	that	thing-
8.	Y:	tiedan		[keyi	ba]					
		iron egg		Aux	FP					
9.	E:			[buneng	dai	ba]				
				Neg-Aux	bring	FP				

```
Y:  'To buy something (for you) to eat. (Do you) want "Guaiguai"?'
    (.7) ((sound of breathing))
K:  (.3) ˙hh
    (1.8)
E:  '(I) couldn't come up with [anything good] from Taiwan.'
Y:                              '[iron eggs]'
E:  '°iron can that%↓ >can that< be brought (here), that th-?'
Y:  'Iron eggs [should (be) okay].'
E:              '[(they)cannot be brought (here)].'
```

(31) AU-041-Sgr-031-Other

1.	K:	ni	bu	↑zhidao:::nage-		nage	riben	hen	youming
		2sg	Neg	know	that-CL	that-CL	Japan	very	famous
2.		de	lianxu[ju		A-Xing	ah::]			
		Nom	series	drama	PN	FP			

3.	A:		[dui ah		danshi-]				
			right Part		but				
→ 4.	K:	tamen	shi	nage-	**nage:**	**>nge<**	difang	shenme	
		3pl	CP	that-CL	that-CL	that-CL	place	what	
5.		Jiahewu	shenme	de	yinggai	shi	nage	difang	[ba]
		PN	what	Nom	Aux	CP	that-CL	place	FP
6.	S:								[keneng]
									possible
7.	K:	(.3)	shi ah		shi ah				
			CP-FP		CP-FP				

K: 'Don't you ↑know::? That- that quite famous Japanese series Drama ['OShin']?'
A: '[yes, but-]'
K: 'They were in that- **that: >that<** area, what, Kagaya, like that. (It) should be that [place].'
S: '(It's)[possible].'
K: (.3) 'yes yes'

In (30), Y offers E to bring some snacks from home, as Y is about to leave for home. In (31), prior to this stretch of talk, S shares her experience of traveling to Japan with her family. As S is not certain about exactly where in Japan she visited, A and K try to help her come up with the exact destination. The acoustic measurements for R1 and R2 of both recyclings is summarized in Table 4-10:

	Pitch height (Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2
Ex (30)	345-NM-147	290-NM-260	290	247	<0.2	no
Ex (31)	385-291	NM-297	406	140	<0.2	no

Table 4-10 The acoustic measurements of recyclings in Ex (30) and (31)

From Table 4-10, it is shown that in terms of duration, the R1 is longer than R2 in both recyclings. It should be noted, however, that the R1 of the recycling in (30) is initiated by a

cut-off at the end of the auxiliary *keyi* 'can', while the R1 in (31) ends with a stretched second syllable of the distal demonstrative *nage*. One more issue to be noted is that, R2 in both recyclings is realized in a faster speech rate than the corresponding R1, and is marked by the transcription convention "> <". As for silence, the pause after R1 is under 0.2 seconds and thus almost non-perceivable. The measurement of the pitch height of R1 and R2 shows that there is no consistent result observed for whether R1 or R2 of the recycling is realized at a higher pitch height. Alternatively, however, the two recyclings do share a similar pitch realization in that the first syllable in R1 starts at a higher pitch and the final syllable in R1 can have a falling pitch contour; while the pitch range of R2 falls within R1's pitch range. The following Figure 4-4 and Figure 4-5 provide the pitch contour of the recyclings in (30) and (31) respectively:

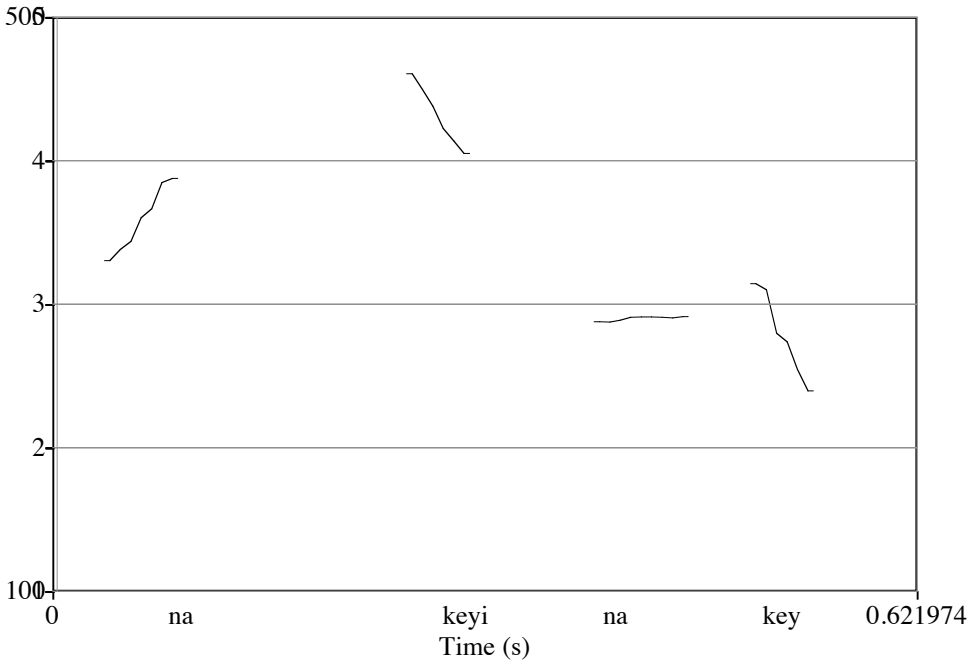

Figure 4-4. Fundamental frequency for the recycling in Ex (30)[23]

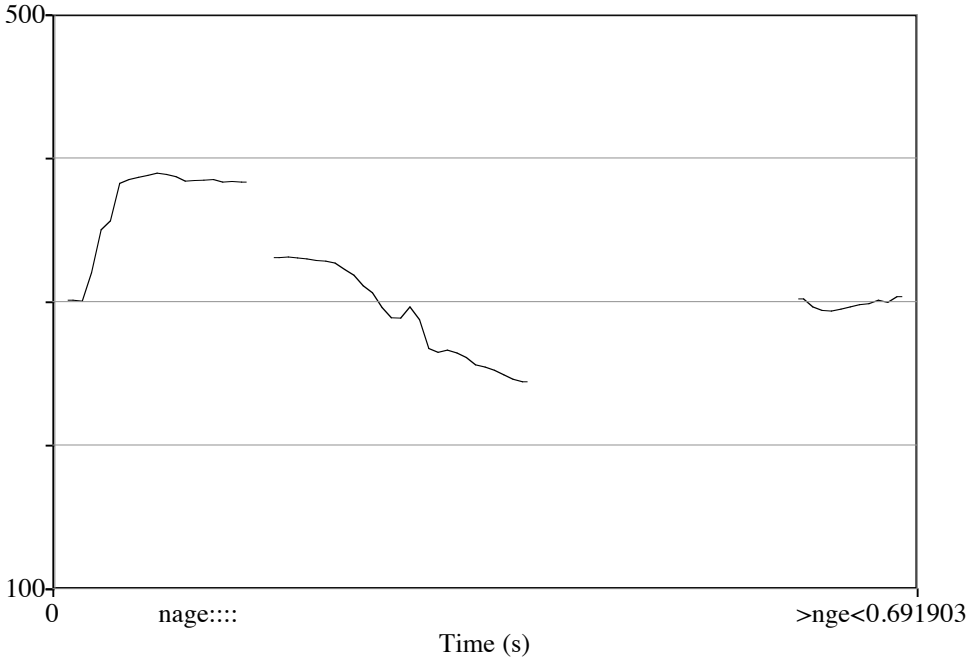

Figure 4-5. Fundamental frequency for the recycling in Ex (31)

Based on the above description, I tentatively summarize sound pattern 5 as:

(32) **[longer R1]+[shorter R2 falling within the pitch range of R1]**

After identifying pattern 5, I turn to a discussion of the interactional function correlated with the pattern in the next section.

4.5.2. Interactional function of pattern 5

To locate the interactional function corresponding to pattern 5, I start with example (30). This sequence of conversation is about offering and rejection. As mentioned earlier, in line 1 Y offers E to bring some snacks from home when Y returns for a visit. After the offer, however, there is no uptake by E and instead a long silence of 0.7-second takes place. Here the silence could be viewed as a "potential rejection" (cf. Davidson 1984) to Y's offer. Then after another 1.8 seconds of silence in which there is still no uptake from E, E finally declines the offer in line 5 by stating she couldn't come up with anything good to be brought from home. Before E finishes the turn, Y overlaps with E's turn by a second attempt of the offer, this time with the suggestion of a specific snack. Thus here Y makes an effort to deal with the rejection by doing a "subsequent version" of providing some space for possible acceptance (cf. Davidson 1984).

Upon hearing the offer in the subsequent version, E is still not willing to accept the offer and questioning the possibility of bringing in such food while entering US customs. It is in this utterance that E produces the recycling I focus on. A possible explanation here is that the recycling at the beginning of the turn in line 7 is involved in initiating a *dispreferred* response, i.e. further rejection to the original offer. Some additional evidence from the interaction between Y and E to show E's reluctance to accept the offer is that, after the question in line 7, Y actually provides a confirmation by saying it is okay to bring the food. But E overlaps with Y's turn in line 9 by an opposing response.

In (31), prior to this fragment of the conversation, K and A were helping S to come up with the name of the destination in Japan where S had toured before. S could only remember what she did during the visit but not the name of the destination. Finally, K suggests a possible location in Japan where the filming of a famous Japanese series drama 'O-Shin' had taken place. A has some doubt about K's suggestion and questions if the character in this drama series actually existed in real life. Before A was able to complete the question, K begins in line 1 by expressing surprise that A doesn't know about this famous drama series. Though A attempts to take back the turn with a disagreement at line 2 (in overlap with K), K eventually "wins" the floor competition and continues speaking in line 4.

The recycling in line 4 is on the distal demonstrative *nage* 'that'. In terms of the syntactic structure of the TCU, the turn starts with the third person plural pronoun plus the copula, *tamen shi* 'they are'. What follows afterwards is the demonstrative *nage* 'that', repeated thrice, which could possibly function as a *placeholder* for the following NP *difang* 'place'. Furthermore, the recycling of *nage* 'that' has a lengthening at the end of R1. So it seems one of the plausible explanations is that the recycling functions for the speaker to carry out a *word search*, similar to the recycling examples discussed in Section 4.3. Another possibility is that, as mentioned earlier, the recycling occurs in a turn that is after an overlapped conversation in competing for the floor. Similar to the recycling in (30), the recycling of the demonstrative *nage* 'that' is used in a turn of *dispreferred* action, i.e. K's taking over the speakership in line 4. Before arriving at the conclusion about the interactional function of pattern 5, let's consider two additional recyclings in pattern 5, given as (33) and (34) below:

(33) AU-05-Sgr-007 ((with some turns omitted))

1.	A:	˙h	ei	dui	ni	shuo	mingtian	nimen	yao	qu: (.2)	hanguo	[chaoshi]	
			Ex	right	2sg	say	tomorrow	2pl	Aux	go	Korean market		
2.	K:											[dui ah]	
												right FP	
3.	A:	[[ei	wo	bu	>zhidao<	qu	hanguo]]	chaoshi	yao	mai	shenme	ye	
		Ex	1sg	Neg	know	go	Korean market		Aux	buy	what	FP	
4.	K:	[[yaobuyao]]]											
		Aux-Neg-Aux											
		((about 3 minutes of discussion omitted))											

5.	K:	oh	gen	ni	jiang	hanguo chaoshi		shi	mian shui		de			
		Ex	Prep	2sg	say	Korean market		CP	free-tax		Nom			
6.	A:	ah	↑ zhende		ma	weishenme?								
		Ex	really		Q	why								
7.	K:	bu	zhidao	>weish<		ta	jiushi	chu	le:: (.)		paocai	shi%		
		Neg	know	why		3sg	precisely-CP	except	Asp		kimchi	CP		
8.		jiushi		shougong		zhiwai	de	paocai	yao	jia	shui			
		precisely-CP		hand-made		other than	Nom	kimchi	Aux	add	tax			
		((about 5 more turns omitted))												
→ 9.	A:	hao	**na**	**wo%↓**		**>na**	**(w)o<**	mingtian	gen	nimen		yiqi		
		good	Conj	1sg		Conj	1sg	tomorrow	Prep	2pl		together		
10.		qu	kankan			hao	le							
		go	take a look			alright	FP							

A: ‘ˈh ei right, you said tomorrow you will go: to the Korean [market]?’
K: ‘[yes]’
A: ‘[[ei, I don’t >know<]] what to buy in the Korean market.’
K: ‘[[(Do you) want to go]]?’
((about 3 minutes of discussion omitted))
K: ‘Oh, tell you what, the Korean market is tax-free.’
A: ‘ah, ↑REALLY? How come?’
K: ‘(I) don’t know >why<. It’s just except for::(.)kimchi, except for the hand-made stuff, kimchi will be taxed.’
((about 5 more turns omitted))
A: ‘okay. **Then I%↓ >then I<** will go with you together tomorrow to take a look.’

(34) AU-03-Sgr-009

1.	S:	jiu	bian		meitian	dou	zai-yiqi hh		jiu	er	gen	si	buhui	
		Adv	turn out		everyday	all	together		Adv	two	and	four	Neg-Aux	
2.		jian[[dao mian]]												
		meet-RC												
3.	K:		[[·h dui		ah]]	biancheng		S	hui- ·hh		da dianhua lai			
			right		FP	become-RC		PN	Aux		make phone call-RC			
4.		wen	wo	shuo:		>yaobuyao<	yiqi		qu h shang- hh -ke [hh]					
		ask	1sg	say		want-Neg-want	together		go to class					
5.	S:												[mei]you	
													Neg-have	
6.		jiu	hen hao		ah::	qishi	meiyou	wo	qishi		benlai		jiu	juede
		Adv	very good		FP	actually	Neg-have	1sg	actually		originally		Adv	feel

7.		(.2)	yinwei	wmen	ziji	xishang	de	yinggai	yao	(.4)	yiqi=		
			because	1st	own	department	Nom	should	Aux		together		
→ 8.	K:	= ·HH	dui	ah	qishi	**wo**	**hen**	**↓jiu::**	**°w**	**hen jiu**	meiyou		
			right	Part	actually	1sg	very	long	1sg	very long	Neg-have		
9.		zai:	(.)	zai	xiuke	le=							
		Asp		Asp	take course	FP							
10.	S:	°un											

S: 'It turns out (we are) together everyday ((laughing)) (We) just don't get to see each other on Tuesday and [[Thursday]].'
K: '[[right]], (it) turns out that S (you) would- ·hh call and ask: if (I) >want< to walk to class together [((laughing))].'
S: '[well], (that's) just very good: actually no, actually I just feel that(.2) because we are in the same department, (then we) should (.4) together='
K: '=·HH right, actually **I for a ↓while:: °I for a while** haven't been: (.) been taking any class.'
S: '°un'

The sound realization of these two recyclings in (33) and (34) follows the description of pattern 5[24]. In (33), prior to this stretch of conversation, K has invited A to join a trip to a Korean supermarket the next day. Note here the original action of invitation did not take place in this recording of conversation, but the topic was brought up by A in line 1 with the question 'so you said you want to go to the Korean market tomorrow' to K. After some extended discussion on other topics related to visiting the Korean market, including the discussion about why the Korean market does not charge tax in lines 5 to 8, A finally accepts the invitation in line 9. In this line, A indicates her acceptance by starting the turn with the reactive token *hao* 'okay', followed by the recycling of the combination of the conjunction *na* 'then' plus a singular 1st personal pronoun *wo*.

Here for the function of the recycling in line 9, when considering the turn in line 9 alone, it seems that the recycling could be interpreted as initiating an acceptance to the invitation. However, if we trace back to the turn in which the topic was initiated, namely line 1, it is located at least 3 minutes away from the original invitation. In other words, the acceptance by A should be considered as a "very delayed" acceptance. Some further evidence from the interaction can be found at the turns in line 3, where A follows up the initial question by stating that she's not sure what to buy from the Korean market and implies the speaker's uncertainty about joining the trip. The statement could actually be taken as a potential rejection. Later on in the discussion K provides various incentives or "subsequent versions" (cf. Davidson 1984) to persuade A, such as bringing up the information about tax-free shopping at the Korean market in lines 5 to 8. Eventually A accepts the invitation and agrees to join the trip.

Turning to (34), part of it has been discussed earlier in Section 4.4.2[25]. To recap the background story for this segment of conversation: starting in line 1, S talks about how she and K meet each other very often during the current semester. In reacting to S's statement, K initiates a direct comment to S in a teasing tone in line 3, and thus produces a dispreferred comment. Then S in lines 5 to 7 provides an account as to why she would do so. Afterwards K produces a disalignment to further distance away from S's statement. The recycling of *wo*

hen jiu 'I for a while' following the initial adverb *qishi* 'actually', with a lengthened R1, could reflect that the current speaker is encountering some problems, namely the production of the disaligned action.

The recycling examples in (33) and (34), therefore, provide additional evidences that sound pattern 5 is used in recyclings located in turns of *dispreferred actions*, i.e. the initiation of the *delayed acceptance* by the recycling of *na wo* 'then I' in (33) and the recycling of *wo hen jiu* 'I for a while' in producing the *disalignment*. Based on the above recycling examples, it is suggested that pattern 5 [longer R1]+[shorter R2 falling within the pitch range of R1] is used in recyclings initiating or projecting *dispreferred* turns. The actions conveying the dispreference could range from a questioning response, a delayed acceptance, a disaligned action, or the action of taking over conversational floor. Interestingly, it is found here that to carry out these dispreferred actions, the interlocutors may incorporate recyclings as a device to delay the actions of dispreference.

In terms of the sound realization, as mentioned above, the R1 can end in either the cut-off (cf. in (30) and (33)) that initiates the recycling, or in the lengthening (cf. in (31) and (34)) that reflects hesitation or delay in the production of the dispreferred action. Furthermore, from the

examples above, all four recycling share the feature of a rather short R2. The shorter duration in R2 may result from a faster speech rate, or reduced syllables (such as the reduced first personal pronoun *wo* in the recycling of (34)). When we turn to the functional side, it is possible that, since the interlocutors are involved in the dispreferred actions, after the recyclings are initiated, they will get right on to the R2 and hurry through the dispreferred actions, so as to avoid further embarrassments brought up by the dispreferred actions. This also explains why no additional pause would be required in between the R1 and R2 of the recycling.

One more point about the sound feature of pattern 5 is the pitch difference between R1 and R2. From the sound format of pattern 5 in (32) it is stated that the pitch range of R2 falls within the pitch range of R1. A plausible explanation is that, due to the reduced R2, there is little time for a wider range of pitch variation.

A count of the occurrence of pattern 5 in the recycling corpus shows that altogether there are 10 examples of recycling realized in this pattern. In addition to the 4 instances discussed above, the other 6 recyclings in pattern 5 are also located in turns of dispreferred actions. One final point to address here is the recycling in (31) that involves the distal demonstrative *nage*. Earlier during the discussion, there was no final conclusion arrived at regarding the function to this

recycling, as it still seems possible that the recycling could also carry the function of word search, in addition to being located in a dispreferred turn. In the next section, I will turn to address this question and provide a possible explanation.

4.5.3 Comparison with sound pattern 3

Before providing some plausible explanation to the recycling of the distal demonstrative *nage* in (31), I first start with one more recycling also of the demonstrative *nage* in the following example (35):

(35) CA-05-Sgr-031

1.	H:	dou	hen	Taiwan	de	[mingzi]							
		all	very	PN	Nom	name							
2.	C:					[↑ dui ah]							
						right FP							
3.	H:	◦ dui ah											
		right FP											
4.	C:	↑ XU YINGyin			jiu[ming	a:]							
		PN			save life	FP							
→ 5.	H:					[o:]	na-	keshi	**nage: ↓-**	**nage**	Yingyin		
						Part	that	but	that-CL	that-CL	PN		
6.		shi%		(.)	shi	hanguoren							
		CP			CP	Korean							
7.	C:	o	o	o	[okay:	nanguai]							
		Ex	Ex	Ex	okay	no wonder							
8.	H:				[dui	suoyi	nage	make sense]					
					right	so	that-CL	make sense					

```
H:  '(Those) names sound so [Taiwanese].'
C:                          '[↑right].'
H:  '°yes.'
C:  '↑XU YINGyin, oh [my god]!'
H:                    '[o:], that- but that:↓, that Yingyin is% (.) is
    Korean.'
C:  'oh oh oh, [okay: no wonder].'
H:             '[right, so that makes sense].'
```

The sound pattern realized in the recycling of *nage* 'that' follows the description of pattern 5 provided in (32)[26]. To introduce the context of the recycling, prior to the fragment of conversation presented in (35), C has been looking through a list of Chinese names of H's American students and is making comments about how some of their Chinese names sound rather funny. Turning to the transcription of the conversation in (35), in line 1, H has commented on the Chinese names of her students and about how these names sound very "Taiwan-like". C agrees in line 2. After another *dui ah* 'right' of self-confirmation by H, this sequence seems to have reached a place of possible closure. At some point before line 4, C comes across one of the names and with this utterance expresses her amazement about how the student would get such a Chinese name. C's surprised tone is reflected by a high pitch level and louder voice when spelling out the name, as well as the comment *jiuming a* 'save me (god); oh my god' that follows. Before C finishes the turn expressing exclamation, H overlaps C's TCU to provide some justification on why the Chinese name of the student would sound rather unusual (as the student is actually Korean and already has her Korean name in Chinese characters.) By providing C with unknown background information about the student, H may feel that the justification could be heard as a correction to C's surprise in the previous turn. In

this case, H's reply in lines 5 and 6 could be taken as a *dispreferred* response.

If we take a closer look at the turn starting in line 5, H initiates the turn with the particle *oh*, which functions to acknowledge reception of C's reaction to the name in the previous turn and it is in overlap with the end of C's previous TCU. After the overlap, H continues with the demonstrative *na* 'that', but it is cut off by the speaker herself. Right after the cut-off there is the conjunction *keshi* 'but' that can function to project that H is about to bring up a counter statement. What follows is the distal demonstrative *nage* 'that' in recycling. A question here is the function of the recycling of *nage* 'that'. If we look further within the turn, the NP following immediately after the recycling is the proper name, which C has just mentioned in line 4. Thus it seems less likely the demonstrative *nage* 'that' is being used for a word search, at least not for the proper name immediately following it.

Another possible explanation, then, is in initiating the recycling to provide the counter statement, H at the same time delays her dispreferred response. H's delay in producing the dispreferred response is further reinforced by the slightly lengthened R1. Moreover, note here in the sound realization of the recycling that there is no significant pause between R1 and R2. As explained earlier in the discussion of the interactional function to pattern 5, the lack of

additional pause between R1 and R2 could be due to the fact that the interlocutor wants to get to the content of the dispreference as soon as possible to avoid further embarrassment, so there is no further delay in producing the R2. Further evidence to support this point is the relatively shorter R2 in the sound realization. Thus instead of serving the function of word or content search, the recycling of *nage* 'that' in pattern 5 may carry a different function that involves the production of a correction to the other speaker as a dispreferred action.

From the above discussion, therefore, further evidence has been provided to substantiate the function of recycling examples realized in sound pattern 5. Finally, but not the least, as for the recycling of the same distal determiner *nage* 'that' in (31), it does seem that the recycling could also be used for the function of word search. Such observation, however, is based mostly on the syntactic structure of the turn. When considering the sound realization incorporated in the execution of the recycling, it could otherwise provide some alternative explanation for why the speaker at that point in the turn recycles the word for specific reason in the interaction[27].

4.5.4 Section summary

In summary, in this section I focusd on sound pattern 5 [longer R1]+[shorter repairing segment falling within the pitch range of R1]. It was suggested that the pattern is used in some

Mandarin recyclings that are located at turns of *dispreferred* actions, specifically actions such as rejection to an offer, delayed acceptance to an invitation, or disalignment. Sometimes the recyclings were initiated by cut-offs at the end of R1s in these recyclings, while in some cases the R1 could be lengthened to reflect the interlocutors' hesitation in producing the dispreferred action. When speakers got pass the R1, they followed up right away with the R2 and without further delay. This could be due to that the speakers are trying to hurry through the content of the dispreference. As a result of faster speech rate in R2, the pitch contour of R2 is flattened and falls within the pitch range of R1.

4.6 Chapter summary

In this chapter, I identified five distinct sound patterns used in Mandarin recycling repair. The five patterns share one common sound feature in that the recyclings in these patterns are all realized with longer R1. Sound pattern 1 was identified as [longer R1 with cut-off]+[R2 at same pitch height], and it was suggested that pattern 1 functions to *project a continuation of further explanation*. In terms of sound, the function of continuation is reflected mostly in that R1 and R2 are held at almost the same pitch level. Pattern 2 was identified as [longer R1 with cut-off]+[R2 at higher pitch height]. It has been demonstrated that interlocutors may incorporate the higher pitch height on R2 to *project forward a semantic contrast*, i.e. to change

from talking about one persona to another, or to signal a contrastive object or action to be mentioned.

Pattern 3 was identified as [longer R1 with lengthening and a fall-to-low ending]+[significant silence]+ [R2 at higher pitch height], and it was found pattern 3 is correlated with the specific function of *word* or *content search*. Some recyclings in pattern 3 identified involve repetition of specific Mandarin demonstrative pronoun (i.e. *nage* 'that') or expression *jiushi* "then is" that function as *placeholder* or *floor holder*. It was further pointed out that the action of *word* or *content search* is reflected in the falling-to-low R1 and the significant silence between R1 and R2. There were additional sound variations to pattern 3 located from the corpus: one is the sub-pattern [longer R1 with lengthening] +[significant silence]+ [R2 at higher pitch height]. It was found that this sub-pattern is used in recyclings for introducing actions in delicate situations. A second sub-pattern was identified as [longer R1 with lengthening]+[R2 at higher pitch height] and the lengthening at the end of R1 may function to hold the turn-so-far.

Pattern 4 was described as [longer, higher R1 with lengthening], and it was found that the pattern was used to *restart* the turn after some production problems, i.e. a series of repairs before the recycling. The higher, longer R1 in the pattern functions to signal a restart of the turn after

the production problems. One sub-pattern [longer, higher R1 with *cut-off*] was identified, and it was found in recyclings that occurred in special sequential location such as second pair part. The last pattern identified was [longer R1]+[shorter R2 falling within the pitch range of R1]. It was found in recyclings located at turns of *dispreferred* actions, i.e. rejection to an offer, delayed acceptance to an invitation, or disalignment.

Lastly, the following Table 4-11 provides a summary of number of instances found in each of the five sound patterns:

Patterns	Number of instances
Pattern 1	19
Pattern 2	25
Pattern 3	12
Sub-pattern 3-1	11
Sub-pattern 3-2	8
Pattern 4	6
Sub-pattern 4-1	11
Pattern 5	10
Total	102

Table 4-11 Distribution of number of instances from sound patterns 1 to 5

The next chapter examines the sound pattern(s) realized with longer repairing items (R2).

[1] Tseng (2006) in her study suggests that the *alternation* parts of Mandarin repair tend to be marked by a shorter duration. It should be noted, however, that in her study, the prosodic measurement on duration is done on both examples of repeated and corrected repair.

[2] It should be noted here that, for both recyclings, as the semitone difference between R1 and R2 is at the borderline of 0.5 semitones, there's still a perceivable difference in the relative pitch height between the two segments in the recyclings. In both cases, it is the R2 of the recyclings that is at a higher pitch height.

[3] For the definition of these two types of cut-offs, please refer to Chapter 3, Section 3.2.5.

[4] For the measurement of silent pause, I incorporate a cut-off point of 0.2-second, following Jasperson (1998). For the explanation, please refer to Section 3.2.3 in Chapter 3.

[5] Note here the "initial position" of the TCU is not necessarily limited to the very first lexical item occurred at the beginning of the TCU, but refers to roughly the initial part of the TCU that is constituted of the initial adverb/discourse marker plus personal pronouns.

[6] According to Bolden, when 'so' is used for prefacing sequence-initiating actions, such as questions, it can be used to characterize and constitute a particular action as advancing their interactional agenda. In this case, 'so' as a discourse marker is a resource for "establishing discourse coherence and accomplishing understanding" (2009: 996).

[7] Here the "initial position" is not strictly defined as the very first lexical item of the turn, as at least two of the above recyclings that involve personal pronouns follow other connectives or discourse markers at the beginning of the turns.

[8] One point to make regarding the pitch height between R1 and R2 is that, as suggested in Chapter 3 of methodology, in the current study I use the cut-off point of 0.5 semitones for judging if R1 and R2 are realized as at the same pitch height in the recycling (please refer to Section 3.2.1 for detailed discussion). For the recyclings in (1) and (2), the pitch difference between R1 and R2 in both cases are just about 0.5 semitones. As mentioned earlier, there's still a noticeable pitch difference between R1 and R2 in both cases (especially when listening to the cut-out sections of only the recyclings and not the whole turns with the recyclings via Praat). The same observation also holds for the recycling in (4). It is only with the recycling in (5) that its R1 and R2 is heard as realized almost at the same pitch level (From Table 4-2 it is shown that the semitone difference between R1 and R2 of the recycling in (5) is only 0.2.) Thus the observation seems to suggest that a cut-off point of 0.5 semitones could only serve as a reference

point as a result from psycho-acoustic experiment based on synthetic sounds (cf. Summerfield and Assmann 1991, please see Chapter 3 for further discussion).

[9] The result of acoustic measurements of the recyclings in (6) is summarized in the following table:

	Pitch height (Hz)		Semitone (re 100Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2	R1	R2
Ex (6)	194	196	11.5	11.8	195	141	<0.2S	No

Table 4-12 The acoustic measurements of the recycling in Ex (6)

Here the pitch height difference between R1 and R2 of the recycling is less than 10 Hz. Additional measurements by semitone show that such difference in pitch height correspond to less than 0.5 semitones, which reflects that R1 and R2 could be perceived as realized on almost the same pitch level.

[10] One point to note about the pitch height is that, based on the difference of pitch height between the two syllables in R1 and R2, it seems that R1 of the recycling is on a rather level pitch contour, while R2 with a falling pitch contour. In the actual sound realization, the second syllable "men" in R1 is realized with a slight falling pitch. When the speaker moves on to R2, the first syllable in R2 is realized at a higher pitch height of 296Hz. During the transition from the first syllable to the second syllable in R2, there is also a gradual fall in the pitch contour. The general pitch height of R2, however, is perceived as higher than the pitch height of R1 in this recycling.

[11] Here it refers to Jasperson's discussion on the change of prosody as one of the methods of carrying out English recyclings, i.e. repair initiated by cut-offs, followed by a significant pause then a recycling of the TCU-so-far (1998: 314).

[12] The result of acoustic measurements of the recycling in (10) is summarized in the following table:

	Pitch height (Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2
Ex (10)	224	248	181	94	<0.2S	no

Table 4-13 The acoustic measurements of the recycling in Ex (10)

As can be seen, the result of acoustic measurements of this recycling example still confirms pattern 2 [longer R1 with cut-off]+[R2 at higher pitch height] described in (10).

[13] The result of acoustic measurements of the recyclings in (11) and (12) are summarized in the following table:

	Pitch height (Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2
Ex (11)	26	228	154	125	<0.2S	no
Ex (12)	204	223	247	164	<0.2S	no

Table 4-14 The acoustic measurements of recyclings in Ex (11) and (12)

[14] The "H" in the Tables that present result of acoustic measurements throughout this thesis stands for a *higher* pitch height of the syllable in the R1/R2 of the recycling, when comparing to the corresponding syllable in the counterpart segment of the recycling. Here "H" is incorporated to mark the cases when there is no exact pitch measurement yielded by using Praat but the syllable is perceived as in a higher pitch height by the impressionistic judgment.

[15] Hayashi and Yoon (2006) explore the uses of demonstratives as "filler words" in contexts where speakers encounter trouble formulating a word. In this study Hayashi and Yoon take a cross-linguistic approach to examine the range of forms and functions of the demonstratives across diverse languages, and Mandarin is one of them (2006). Of the three types of usage of demonstratives in the context of word-formulation trouble Hayashi and Yoon identify, two are related to our discussion of Mandarin recyclings: the *placeholder* use, and the *interjective hesitator* use (2006). According to them, placeholder is a referential expression that is used to substitute for a specific lexical item that has temporarily eluded the speaker (Hayashi and Yoon 2006: 499). A placeholder demonstrative participates in the morpho-syntactic structure of an unfolding utterance and it occupies a syntactic slot that would have been occupied by the target word (Hayashi and Yoon 2006). It is suggested that frequently, a placeholder demonstrative is subsequently replaced by a more specific word that has become available to the speaker as a result of word search (Hayashi and Yoon 2006).

[16] In Mandarin, *jiushi* is a word consisted of the adverb *jiu* "a versatile adverb able to carry out a number of functions in different contexts" plus the copula *shi* (Biq 2001: 55). One study on *jiushi* in Mandarin is by Biq (2001), which discusses two related Mandarin expressions *jiushi* and *jiushishuo* by taking a corpus-based approach. Biq (2001) argues that *jiushi* has undergone the process of grammaticalization. Originlly, *jiu* serve as a "backward-linking connective positioned before the predicate in the main clause" (Biq 2001: 55). Based on corpus data of written Mandarin texts, it is suggested that *jiushi* is mostly used as a copula with an emphasis on the preciseness of the equation (Biq 2001: 56). When turning to conversational data, *jiushi* can still be used with the canonical sense of '…then be/is…' But it is also found that some tokens of *jiushi* in the conversation data hardly carry any substantial meaning (Biq 2001). Biq uses the following example to illustrate the point:

B: .. Danshi,
But
B: Zhongguo ne,
China PRT
B: .. fan guolai ne jiushi,
Reverse over PRT JIUSHI
B: .. hen zhongshi zhege wenrenhua.
INT emphasize this M literati painting

B: but,
B: China,
B: on the contrary juishi,
B: regards literati paintings as important. (2001: 60-61)

According to Biq (2001), the word *jiushi* in this example does not function to provide elaboration on something that has been commented on previously, as the following clause "regards literati paintings as important" is actually an initial statement about the NP *zhongguo* 'China' before *jiushi*. Most of all, if *jiushi* were omitted, it would not result in a different meaning for the ongoing talk (Biq 2001). Thus it is suggested that the word *jiushi* in this example is semantically reduced from its canonical copula sense to a mere pause filler, or a *floor holder* (Big 2001: 61).

[17] Following Biq (2001), here I gloss *jiushi* as 'then is'.

[18] Note here in Figure 4-2, there is indeed a sharp drop at the end of the R1 *wo* 'I'. But the drop could be due to the glottalized cut-off at the end of lengthening. As for the pitch contour of the R1 in Figure 4-3, there is actually a slight rising pitch contour accompany the sound stretch. It should be noted that the lexical item *shei* 'who' in recycling has a rising tone. This might explain why the lengthening also has a rising pitch contour.

[19] The recycling at line 5 of (23) involves this disyllabic Mandarin lexical item *keneng* 'probably'. In the actual articulation of this word in the conversational exchange, however, the first syllable [k^hɤ] is realized in a fast tempo and reduced to the initial onset consonant. In other words, the whole word is articulated as [k^h] and as a result, the first syllables of this word *keneng* in R1 and R2 of this recycling yield no acoustic measurement on their pitch height. Thus in Table 4-8 the pitch height reported for the recycling in Ex (23) stands for the pitch height derived from the second syllable of the word in both R1 and R2.

[20] The result of acoustic measurements of the recycling in (25) is summarized in the following table:

	Pitch height (Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2
Ex (25)	109	creaky	343	185	<0.2	no

Table 4-15 The acoustic measurements of the recycling in Ex (25)

[21] The result of acoustic measurements of the recyclings in (26) and (27) is summarized in the following table:

	Pitch height (Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2
Ex (26)	257-242-243	228-229-232	423	318	no	No
Ex (27)	244	223	143	91	<0.2	No

Table 4-16 The acoustic measurements of recyclings in Ex (26) and (27)

[22] According to Schegloff, the *insert expansion* has the following two characteristics: a) the adjacency pair is positioned between a FPP and a projected SPP, and b) the insert expansion is initiated by the *recipient* of the preceding FPP (2007: 97).

[23]Note here that for the phrase *na keyi* in R1, it seems to realize in a higher pitch height than R2. By an impressionistic judgment, however, the pitch contour in the figure does not reflect actual perception of the pitch height faithfully. Therefore, I use the function of "Periodicity" in Praat to carry out additional analysis and find that the last syllable in R1 has a falling pitch contour from 260 Hz to 204 Hz.

[24] The acoustic measurements of the recyclings in (33) and (34) are summarized in the following table:

	Pitch height (Hz)		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2
Ex (33)	310-C	284-H	332	216	<0.2	no
Ex (34)	263-283-C	232-236-NM	514	446	no	no

Table 4-17 The acoustic measurements of recyclings in Ex (33) and (34)

[25] Earlier in Section 4.4.2, example (25) the recycling of the aspectual marker *zai* (at line 9 of example (34) here) had been presented and discussed.

[26] The acoustic measurements for the recyclings in (35) are provided in the following table:

	Pitch height (Hz)		Loudness		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2	R1	R2
Ex (35)	395-273	354-314	70	69	303	267	<0.2	no

Table 4-18 The acoustic measurements of the recycling in Ex (35)

[27] Here another analysis that could be incorporated to locate the function of the recycling in (31) is by resorting to a multimodality approach by taking into consideration such as visual conducts of gesture. There had been studied by Goodwin and Goodwin (1986) and Hayashi (2003) showing that when doing word search in English and Japanese conversation, the action may be accompanied by non-vocal gestures including aversions of gaze away from the recipients and a variety of manual and facial gestures. The conclusions from these studies point to a direction of pursing further evidence to substantiate the function of the recycling by examining not only the sound production, but also visual presentations such as gaze and gestures.

Chapter 5 Findings II: Sound pattern 6

This chapter is the second chapter that presents the prosodic patterns identified from our recycling corpus. This chapter examines one more prosodic pattern in the recyclings from the corpus. In contrast to the sound patterns described in Chapter 4, the prosodic pattern presented in the current chapter is realized with the distinctive sound feature of a *shorter* duration in the repairable items (R1), in comparison with the corresponding repairing items (R2). It is interesting to note that of all the instances of full recyclings found in the corpus, only 25 examples have a shorter duration in the R1. In other words, over 83% of the full recycling examples are realized with longer R1 from the current recycling corpus. This finding is consistent with the result reported in Tseng (2006) that in average the *alternation* part (or R2) of Mandarin repair has a shorter duration[1].

Although it is found that Mandarin recyclings are seldom realized with shorter R1, this does not mean, however, that these recycling examples should be taken as "peripheral" and be disregarded. Actually, as will be seen in the following discussion, I have identified more than one sound pattern realized with shorter R1. Furthermore, it will be demonstrated that at least one of the sound pattern can be paired with a specific interactional function. In the process of identifying the interactional function corresponding to the sound pattern, I will also explore some

possible explanations to the relationship between the function and sound realization, i.e. why R1 in these recyclings is the shorter segment. Moreover, the sound pattern described in the present chapter can serve as further contrast to the sound patterns established in the previous chapter.

The chapter will be presented as follows. Section 5.1 introduces sound pattern 6, which is realized with shorter R1 followed by R2 at a higher pitch level and with louder volume. Section 5.2 is the chapter summary.

5.1 Pattern 6

In this section I examine one of the sound patterns that are realized with a shorter R1. In Section 5.1.1, I will describe sound pattern 6. Section 5.1.2 focuses on the interactional function corresponding to pdsattern 6. In order to distinguish pattern 6 from other sound patterns, in Section 5.1.3 further comparison of recyclings in pattern 6 and other sound patterns previously established will be made. Section 5.1.4 concentrates on one of the sound features in the sound pattern, namely the duration difference between R1 and R2.

5.1.1 Pattern 6: **[shorter R1 with cut-off]+[higher, louder R2]**

To introduce sound pattern 6, I start with the following examples:

(1) Ca-05-Sgr-008

1.	C:	>houlai	wo	jiu	xiangshuo<	a	↑budui	budui	(.)	
		afterwards	1sg	just	think-say	Ex	Neg-right	Neg-right		
2.		tade-	tade:	xing	[shi	Van.]				
		3sg-Poss	3sg-Poss	last name	CP	PN				
3.	H:				[suoyi	nage:](.)	yinggai	shi (.4)		
					so	that-CL	Aux	CP		
4.		o	yao	>zheyang<	suan	suoyi	shi	Van		
		Ex	Aux	like this	count	so	CP	PN		
→ 5.	C:	dui- <	°**ta%**	**TA**	ruguo	pai	zai	dianhuabu		
		right	3sg	3sg	if	order	Prep	phone book		
6.		huo shenme	ta	shi	V	(.)	yao	zhao	a	kaitou
		or else	3sg	CP	PN		Aux	look for	A	initial

C: '>Afterwards I thought<, a, ↑no no,(.) her- her: last name [is Van].'
H: '[So that:](.) should be (.4)oh, it should be taken >like this<, so it is Van.'
C: 'yes- < if °**it% it** is in the phonebook, or something like that, it (would) be listed under V,(.) and (I/we) have to look for (the first name) under A initial.'

(2) AU-051-Sgr-016

1.	A:	shi	tong	yi jia	duibudui	shi	LiYuan	duibudui?		
		CP	same	one-CL	right-Neg-right	CP	PN	right-Neg-right		
2.	K:	dui	dui	[dui]jiu	zhi	you	na	yi jia	[[ah::::]]	
		yes	yes	yes just	only	there	that	one-CL	FP	
3.	A:			[un]					[[oh oh oh oh::::]]	
4.		hao		h[ao]						
		okay		okay						
5.	K:			[dui]	ranhou	jiu::: (.)	women	shi	qian	
				yes	then	just	1pl	CP	before	
→ 6.		jige	li>bai	↓**you%<**	**you**	yige	li% (.2)	you		
		several-CL	week	there	there	one-CL	we-	there		
7.		yige	zhoumou	shi:: (.5)	S	ta	nanpengyou	you	lai:	
		one-CL	weekend	CP	PN	3sg	boyfriend	Aux	come	

A: '(It) is the same one, right? LiYuan, right?'
K: 'right, yes, [yes], there's only that [[one]]!'
A: '[un] [[oh]] oh oh oh:: okay ok[ay].'
K: '[right], and then, (it was) just::, (.) we were, several weeks

ago, >↓**there%< there** was a wee% (.2) there was a weekend, that was: (.5) S's boyfriend had come:"

The selection of conversation in (1) is taken from the same recording as example (1) in Chapter 4, where C and H discuss the English name of a mutual friend, and which part of the name counts as the friend's last name. In (2), the conversation is when A and K discuss a local Chinese restaurant that sells some traditional Taiwanese snacks during weekends. Acoustic measurements of both recyclings are summarized in Table 5-1 below:

	Pitch height (Hz)		Loudness		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2	R1	R2
Ex (1)	233	254	56	66	151	187	<0.2S	no
Ex (2)	creaky	195	Q	62	128	143	<0.2S	no

Table 5-1 The acoustic measurements of recycling repairs in Ex (1) and (2)
(R1=repairable item in the repair; R2=repairing item in the repair)

As shown in Table 5-1, R2 in both recyclings are realized at a higher pitch compared to the corresponding R1. In fact, not only is R2 of both recyclings realized at a higher pitch, it is also perceived as the louder segment. As for duration, in both recyclings, R2 is longer than R1. One additional place to be pointed out about duration is that, although the measurement in millisecond (msec) shows a longer R2 in both recyclings, the duration difference between R1 and R2 in both cases is quite small. Thus a question concerning the perceivable difference in the comparative duration between R1 and R2 is raised[2]. Some other observation includes that, if we turn back to the transcription, it should be noted that both recyclings are initiated by

glottalized cut-off at the end of R1. Finally, the silence between R1 and R2 is almost non-perceivable in both cases.

The following sound format is thus proposed to account for the prosodic realization of recyclings in (1) and (2):

(3) **[shorter R1 with cut-off]+[higher, louder R2]**

After identifying pattern 6, I now turn to an exploration of the interactional function that could be associated with pattern 6.

5.1.2 Interactional function of pattern 6

To illustrate the function associated with sound pattern 6, here I start with example (1). The recycling in (1) is done on a 3rd person singular pronoun *ta*. As mentioned earlier, in this conversation both speakers have been talking about the English last name of a mutual friend. In line 1 C explains how she figured out which part of the friend's full name counts as the friend's last name. Before C finishes the turn in line 2, H overlaps with C's turn to confirm if she has understood C's explanation correctly. Note here H abandons the turn after producing the copular *shi* at the end of line 3. Then in line 4 H restarts the turn after a 0.4-second pause to show how she comprehends the situation. In return, C provides a confirmation in line 5 with

dui 'right; yes', followed immediately by the 3rd personal pronoun *ta* that gets recycled.

In (2), on the other hand, the speaker recycles the existential *you* located in the middle of the turn by K in lines 5 to 7. Here the conversation is about a local Chinese restaurant that sells some traditional Taiwanese snacks during the weekend. In line 1 A poses the question to confirm that it is the same restaurant they are talking about. To answer the question, K at the next utterance of the second pair part (SPP) responds that there's only one such Chinese restaurant around and that is the one. Then A follows up the confirmation from K by a sequence-closing third (cf. Schegloff 2007). After the sequence-closing third, K resumes her telling about her visit to the restaurant with other friends a few weeks ago. The recycling of the existential *you* occurs in the middle of the turn, when K tries to come up with the time of the recent visit to the restaurant. Here K seems to struggle with the resumption of the talking, which is also reflected in the long stretched adverb *jiu* 'just' in line 5, and the recycling itself later on in the turn.

Interactionally, both recyclings seem to share a similar *sequential* environment in that one of the speakers in the conversation is carrying out the action of *understanding check* and seeking *confirmation* on some information about the current topic, and the recyclings take place after the confirmation is provided. Though it is worth noting that, in (2), the action of *understanding*

check by A takes form of a FPP in line 1, and the question seems to pose some disruption to the ongoing conversation. After K provides confirmation, she resumes the discussion but proceeds with some production problems, possibly due to the disruption as result from the action of understanding check.

Before arriving at a definite conclusion about the functional aspect of pattern 6, I will turn to some more recycling examples also in the same sound pattern. Additional instances are given in (4) and (5) below:

(4) AU-051-Sgr-021

1.	K:	na	ni	shi	zenme	zhidao	shi	xuesheng	gen-		
		then	2sg	CP	how	know	CP	student	Prep		
2.		t[a	gen	ni	jiang]						
		3sg	Prep	2sg	say						
3.	A:	[H		gaosu	wo	de	ah]=				
		PN		tell	1sg	Nom	FP				
→ 4.	K:						=oh:::<	**shi% (.)**	**<u>shi</u>%=**	°H hh	
							Ex	CP	CP	PN	
5.	A:	dui	ah	ranhou	h	ta	jiu	shu[o hh]			
		yes	Part	then		3sg	just	say			
6.	K:							[dui	ah]	na	ta	zenme
								right	Part	then	3sg	how
7.		shuo	lei:::		ta	shuo	shenme				
		Say	FP		3sg	say	what				

K: 'Then how do you know? Was that the student- [he told you so?]'
A: '[It was H who told me].'
K: 'oh:::, (it) **was%(.) <u>was</u>**= °H. ((laughing))'
A: 'right, then she [said ((laughing))]'
K: '[Okay], then how did she feel (about the restaurant)? what did she say?'

(5) AU-012-Sgr-030 (with some turns simplified)

1.	E:	nage:	housing manager		jiu	jiushi		ta	lai	jieshao	de
		that-CL	housing manager		just	precisely-CP		3sg	come introduce		Nom
2.		shihou · hh	shuo	nimen	yinggai	mai	yige		xiyiji		ah
		when	say	2pl	Aux	buy	one-CL		washing machine		FP
3.		ranhou	keyi	shen	henduo	qian					
		then	Aux	save	a lot	money					
4.	Y:	· h hui-	shen		hen ↑duo	ma=					
		Aux	save		a lot	Q					
5.	E:	yinwei	shui	mianfei	dian	mianfei	ah				
		because	water	free	electricity	free	FP				
6.		(1)									
7.	Y:	keshi	ni	qu	xiyifu	ye	buguo		huage-	yikuaiqian	
		but	2sg	go	do laundry	just	no more than		spend-CL	one dollar	
8.	E:	ta jiu	xidao-	(.5)	xidao	(.7)	shuang		hh hhhh		
		3sg just	wash-RC		wash-RC		feel satisfied				
9.	Y:	ha									
		Q									
→ 10.	E:	ni	zi<ji	°**mai%**	**mai**	xiyiji		jiu	xidao	shuang hh	
		2sg	self	buy	buy	washing machine		just	wash-RC	satisfied	

```
E:  'The: housing manager, when s/he came to introduce (the apartment),
    ·hh (s/he) said you should buy a washing machine and then it could
    save a lot of money.'
Y:  '·h would- that save a ↑lot?'
E:  'Because the water is free and the electricity (is) free.'
    (1)
Y:  'But if you do the laundry it's no more than one- dollar.'
E:  'It's just washing (.5) washing till (.7)(you're) satisfied
    ((laughing))'
Y:  'what?'
E:  '(If) you< °buy% buy the washing machine yourself (you can) just wash
    until you're satisfied ((laughing))'
```

The recycling in (4) involves the copular *shi*, while in (5) it is a recycling of the verb *mai* 'to buy'. Acoustic measurements show that the sound realization of both recyclings confirm sound pattern 6 described in (3)[3]. The segment of conversation presented in (4) actually occurs after the conversation in (2). After K talks about her visit to the restaurant, and other extended

discussion related to the topic of the Chinese restaurant, including A's mentioning about that the son of the restaurant owner is one of her students in the Chinese class. Thus K in lines 1 and 2 initiates a question to find out if A got to know about this restaurant from the student. When K proceeds to the preposition *gen* 'with' in the middle of the question, there is a cut-off at the end of the word, followed by a self-repair. Before K finishes the question, A overlaps with K's turn in line 3 and answers that it was actually another friend H who told A about the restaurant. Upon receiving A's answer, K in the sequence-closing third position produces a stretched exclamation *oh* that expresses her reception of the information, followed by the recycling on the copular *shi*. So here again the recycling occurs at the turn after another adjacency pair, with the FPP expressing the action seeking confirmation or clarification, and the recycling takes place after the confirmation is provided.

The recycling in (5), on the other side, is located in a sequence that's slightly different from the previous examples. In (5) the conversation is about buying washing machine, as E explains that the housing manager of the apartment had advised her to buy their own washing machine in order to save some money in lines 1 to 3. Y, however, poses a question in line 4 to challenge the idea. Then E in return provides an explanation in the SPP in line 5. Afterwards, there is a one-minute silence, followed by another adjacency pair of question from Y again in the FPP, and

the justification from E in the SPP. But in the SPP of the second adjacency pair, E provides a justification, which is not quite clear to Y. As result, Y produces an *other-initiated repair* in line 9. The repair initiated by the word *ha* is one of the commonly used "open class" repair initiators (cf. Sidnell 2010) that indicate problems in comprehending the previous turn. When E tries to restate the justification in response to Y's other-initiated repair at line 10, it is also where the recycling occurs.

Based the detailed analysis above, it seems that the recycling in (5) is sequentially different from the other recyclings discussed so far in that, it is located at the utterance after the other-initiated repair, and at the SPP in the adjacency pair. From an alternative perspective, the reason for Y to initiate the repair in line 9 is mainly for the action of *seeking clarification*. This is due to that Y didn't quite comprehend the previous utterance by E in line 8. Moreover, turning back to E's justification before the other-initiated repair in line 8, E actually shows some hesitation in providing the justification, such as there is another recycling of the compound verb *xidao* 'to wash' plus the resultative complement, and the long pause in between the R1 and R2, as well as after the recycling. At the end of line 8, E finally comes up with the word *shuang* 'to feel satisfied' to describe the resultative state (of the action 'washing'), and produces the word in a joking tone, then followed by laughter. This explains why Y didn't quite catch the whole

utterance clearly and thus initiates the repair in line 9. It is because of Y's other-initiated repair that E has to clarify her previous point again. While producing the clarification, E faces some problem restating the clarification. Thus the recycling of the verb *mai* 'to buy' occurs. So the recycling in (5) is incorporated in a way that's quite similar to the other three recyclings in that it takes place after the other interlocutors' seeking for clarification and the recycling shows the speaker's struggling in getting back to the conversation.

It is suggested that pattern 6 [shorter R1 with cut-off]+[higher, louder R2] may be adopted by Mandarin speakers at the turns after the other interlocutors posing questions for *confirmation* or *clarification* on the topic under discussion. The action of seeking confirmation or clarification takes the form of FPP in an adjacency pair and can be viewed as disruptive to the ongoing conversation. The question may lead to a confirmation from the other speakers (but does not have to). After the confirmation by the reactive token, the recycling takes please before the speaker resumes the discussion. Thus the recycling may indicate the speaker's struggling with getting back to the conversation. Sometimes it can take additional effort from the speaker to return to the original discussion, i.e. in (2) there is additional sound stretch before the recycling.

In terms of the sound realization, all the four recyclings in pattern 6 discussed above are initiated by cut-off at the end of R1. In initiating the recycling via the cut-off, we also find that the R1 has been rushed through, or the speaker may "jump start" from the syllable preceding R1 directly to R1. This may explain why the R1 in pattern 6 is shorter. Moreover, in some cases the R1 are realized relatively quieter (cf. in (1) and (5), marked by the transcription symbol "°") or sometimes at a lower pitch height, even dropping as low as creaky (cf. in (2)). All these sound features result in the relatively higher and louder R2. It is as if the speakers reflect the struggling of returning to the previous discussion by the quieter or lower-pitched R1. Furthermore, the rather compressed R1 may be due to that the speaker is trying to get through the initiation of the repair as fast as possible. Then the speaker follows up with the longer, higher and/or louder R2 to emphasize the establishment of further talk in order to keep on with the discussion.

To summarize, here it is suggested that pattern 6 could be used by Mandarin speakers in recyclings that are located at the turn after the other interlocutors' questions asking for confirmation of clarification and thus can be disruptive to the on-going conversation. The recyclings may reflect the current speaker's struggling to get back to the conversation and re-establishing the on-going discussion. For the sound realization, the shorter duration of R1 in

these recyclings may be resulted from the faster speech rate starting from the lexical item prior to the recycling, or a jump-start from the word prior to the recycling to R1. While there is a rush through to get over the repair initiator in R1 (and sometimes quieter or at lower pitch height), R2 of the recyclings is at a higher pitch height and louder volume that indicate the speaker's attempt to establish the following content of the turn after the source of trouble.

In the next section, I will turn to the discussion about the relationship between recyclings realized in pattern 6 and the recyclings in sound pattern 2, namely [longer R1 with cut-off]+[R2 at higher pitch height] that functions to *project a shift in a contrastive viewpoint*, discussed in Chapter 4. One reason to bring up the comparison here is that pattern 2 and pattern 6 are similar, in that both patterns have their R2s at a higher pitch height. So the question here is if the two patterns should be taken as two distinct patterns, or perhaps one of the two could be in the relationship as a sub-pattern. I suggest that these two patterns should be considered two separate patterns, based on the different interactional functions correlated with each pattern.

5.1.3 Comparison

In order to further establish sound pattern 6 as a separate pattern, I compare the above recycling examples in pattern 6 with recyclings realized in sound pattern 2. As mentioned

above, sound pattern 2 was identified as [longer R1 with cut-off]+[R2 at higher pitch height], and it is differentiated from pattern 6 in the relative length between R1 and R2. Here to make the comparison, I use the recycling in (1) as example. Recall that the recycling in (1) was on the third person singular pronoun *ta*. It has been suggested that the shorter R1 of the recycling reflects the speaker's struggling with getting back to the talk after the action of seeking confirmation from the other speaker, and the higher, louder, longer R2 reflects the current speaker is ready getting back to the conversation and trying to secure the turn. On the other hand, the following recycling realized in pattern 2, is repeated from example (7) in Section 4.2.1 of Chapter 4:

(5) CA-02-Sgr-030

	1.	C:	jiu	xiang	xiang	women	zheyang	ah	women	ruguo-	ni-	ni	
			just	like	like	1pl	this	FP	1pl	if	2sg	2sg	
	2.		prelim	guo	le	[zhihou::]							
			prelim	pass	Asp	afterwards							
	3.	H:				[unh]							
	4.	C:	ni	xianzai	quit (.)	ni::(.)	you	yige	shuoshi	de	zi[[ge]]		
			2sg	now	quit	2sg	have	one-CL	master	nom	qualification		
	5.	H:									[[mm]]		
	6.	C:	dui										
			right										
→	7.		>°jiuxiang		tamen	nayang<	**tamen-**	**>tamen**	shi	yao<			
			just like		3pl	like that	3pl	3pl	CP	Aux			
	8.		kao zigekao			haishi	shenme						
			take qualify examination			or	what						

C: 'it's just like like us, if we- one- one passes the prelim and [afterwards:::]'
H: '[unh]'
C: 'you quit now (.) you::(.) would earn a qualifica[[tion]] of MA.'
H: '[[mm]]'
C: 'Right >°(It's) just like them, like that. <**They**- >**they** have to< take the qualifying examination or something like that.'

As shown in Chapter 4, the recycling of the third person plural pronoun *tamen* in (5) functions to *project forward a semantic contrast*. This is done by initiating the recycling with the cut-off at R1, followed by R2 at a higher pitch height to establish the contrast. If we examine further the sequential location of the turns where the recyclings occur, it is quite clear that the recycling in (1) is at the turn after the other speaker's request for confirmation, while the recycling in (5) is at the middle of a continuous turn that is under the discussion on the same topic. The recycling in the latter case functions as a shift of talking about a different person. Based on the difference in the *sequential location* of the recyclings, it is suggested that the two sound patterns carry rather distinct functions and thus should be considered separate sound patterns.

One additional point to address here is that, if we turn to the sound features of these two sound patterns, the two patterns do share the similarity in that their R2 is at a higher pitch height. It was suggested that the shift in pitch height to a higher R2 in sound pattern 2 might reflect a *semantic contrast*; while in pattern 6 the higher R2 is coupled with other features including the longer duration and sometimes louder volume to suggest the speaker's attempt to secure the turn

after disruptive sequences prior to the repair. Furthermore, as mentioned above, the two patterns differ in whether the R1 or R2 in the recyclings is the longer segment. I have shown that the relative length between R1 and R2 in the two sound patterns may have to do with if the R1 or R2 is realized in a faster speech, i.e. if there is a jump start from the syllable prior to the recycling to the R1 of the recycling (such as recyclings in sound pattern 6), or if the R2 is in a faster speech rate and being rushed through to the syllable following the recycling (such as recyclings in sound pattern 2). Thus the recyclings in two different sound patterns would be perceived differently in terms of the sound realization and therefore it is further motivated to establish the two patterns as distinctive from each other.

With regard to the sound feature of duration difference between R1 and R2, one final point to address is that, as mentioned in Section 5.1.1, the duration difference between R1 and R2 in the recyclings of (1) and (2) is rather small. I will address this point in the next section.

5.1.4 Note on duration

One final point to address in the discussion of pattern 6 concerns the duration difference between R1 and R2 of the recyclings. When turning back to the acoustic measurements presented in Table 5-1, we can find that the duration difference between R1 and R2 in both

recyclings is quite small: in (1) the duration of R1 and R2 in the recycling has 36 milliseconds difference and in (2) only 15 msec. A question here is if such small difference in duration between R1 and R2 of the recyclings would be perceivable by the interlocutors as enough distinction to tell the longer segment from the other between R1 and R2. Actually, there are at least 10 examples of recyclings in pattern 6 found in the recycling corpus, and of the 10 recyclings, the duration difference between R1 and R2 in msec. is between 15 to 136 msecs.

In order to determine if the duration difference between R1 and R2 of the recyclings entails significant difference in length between R1 and R2, a statistical analysis of T-test has been carried out. The result reveals that duration difference between R1 and R2 of the recycling examples in pattern 6 is significant statistically [t (9)=5.24, $p < .001$]. In other words, there's at least statistical evidence to show that the duration of R1 and R2 in the recycling is significantly different. Actually, in a follow-up analysis of the duration difference between R1 and R2 of the recycling instances of the 6 sound patterns via T-test shows that it is still statistically significant [t (110)=10.41, $p < .001$].

Here it is found that, by a statistical analysis, the length of R1 and R2 of the recycling examples discussed in the current study is significantly different. It is suggested that the result

based on statistical analysis may provide some of the evidence in determining the duration difference between R1 and R2 of the recycling. There are other possible methods that can be adopted to categorize recyclings based on prosodic features, i.e. Plauché and Shriberg (1999) propose a data-driven subclassification of disfluent repetitions based on prosodic features and use a hierarchical clustering model of various prosodic features[4]. It should be noted, however, that such methodology also requires large quantity of example database to validate the model for classification.

5.2 Chapter Summary

To summarize, in this chapter sound pattern 6 was introduced as [shorter R1 with cut-off]+[higher, louder R2]. It was found that the recyclings realized in the pattern were sequentially located after a turn requesting confirmation or clarification on a point of the previous interaction, and the action can be disruptive to the on-going conversation. After the confirmation was provided, the recyclings occurred. Sometimes the speakers at the turn of the recycling may show trouble getting back to the conversation. The shorter R1 in the sound format was as the result of a faster speech rate from the beginning of the turn, or a jump-start from the word prior to R1. R2 was at a higher pitch height and louder volume, which reflect the re-establishment of the turn to be projected.

I further established pattern 6 as a separate sound pattern, based on a comparison between sound pattern 6 and pattern 2 from Chapter 4. It is suggested that the two sound patterns should be considered separately due to different functions each pattern corresponded to. A final point to address is the question concerning duration difference between R1 and R2 of the recyclings in pattern 6. As the duration difference was quite small in milliseconds, further analysis using statistical methods were adopted to show that such small difference still made significant difference statistically.

[1] Tseng (2006) in her study suggests that the *alternation* parts of Mandarin repair tend to be marked by a shorter duration. It should be noted, however, that in her study, the prosodic measurement on duration is done on both examples of repeated and corrected repair.

[2] I will turn to further discussion on this point in the following Section 5.1.4.

[3] The result of acoustic measurements is summarized in the following table:

	Pitch height (Hz)		Loudness		Duration		Pause (follows)	
Examples	R1	R2	R1	R2	R1	R2	R1	R2
Ex (4)	L	441	?	70	185	239	<0.2S	no
Ex (5)	L	207	54	59	109	134	<0.2S	no

Table 5-2 The acoustic measurements of the recycling in Ex (4) and (5)

[4] According to Plauché and Shriberg (1999), their hierarchical clustering model is constructed based on normalized prosodic features identified from instances of disfluent repetitions. For the

feature of duration, it is normalized by first identifying the mean duration of the fluent instances of the target word by speaker (note in their study, Plauché and Shriberg focus on repetitions of only the word 'I' or 'the' in English conversation.) Then the normalized duration difference of R1 and R2 of the repetition is calculated by a ratio of the difference in duration between R1 and R2 divided by the mean duration of the fluent instances (Plauché and Shriberg 1999).

Chapter 6 Conclusion

This chapter concludes the current study by summarizing significant findings first. Section 6.2 addresses some of the limitations. Section 6.3 provides discussions on directions for future research.

6.1 Summary of significant findings and contributions

By the approaches of *interactional prosody*, the current study examines the sound patterns accomplished in the process of doing a specific type of repair, namely recycling repair, and how the sound patterns are correlated with the interactional aspects of the recyclings. On the basis of qualitative analysis of approximately 334 minutes of videotaped or audiotaped, naturally occurred Mandarin conversation involving speakers from the same region, 6 distinct sound patterns were reported and each corresponds to a specific function for interaction. One of the major contributions of the findings here is to demonstrate how speakers in conversation orient to the sound realization for specific interactional purpose and sequential organization of the interaction, especially through interactionally significant devices such as repair.

In terms of sound realizations in the recycling repair, the prosodic cues observed to form the sound patterns may include: duration, pitch height, and silence. Additional sound cues such as

cut-off and sound stretch that served as repair initiators were also considered while establishing each pattern. The sound patterns identified were reported in formats emerged from recyclings as combinations of these prosodic cues, i.e. longer repairable segment (R1) initiated by cut-off (or lengthening, and then followed by a significant pause (or not) plus a repairing segment (R2) at a higher pitch height. The 6 sound patterns identified are summarized in the following Table 6-1.

Pattern 1: [longer R1 with cut-off]+[R2 at same pitch height]
Function: to *project a continuation of further explanation* on the current discourse topic

Pattern 2: [longer R1 with cut-off]+[shorter R2 at higher pitch height]
Function: project *a shift in a contrastive viewpoint*

Pattern 3: [longer R1 with lengthening and a fall-to-low ending]+[significant silence]+[R2 at higher pitch height]
Function: *word search* or *content search*

Sub-Pattern 3-1: [longer R1 with lengthening]+[significant silence]+ [R2 at higher pitch height]
Function: word search or content search, under delicate situation

Sub-Pattern 3-2: [longer R1 with lengthening]+[shorter R2 at higher pitch height]
Function: holding the turn for content search

Pattern 4: [longer, higher R1 with lengthening]
Function: some substantial production problems (such as additional examples of repair) before the recycling, and the recycling signals a *restart* or some new information about the current conversation

Sub-Pattern 4-1: [longer, higher repairable segment with cut-off]
Function: initiating new information in SPP

Pattern 5: [longer R1]+[shorter R2 falling within the pitch range of R2]
Function: for recyclings at turns of dispreferred actions

Pattern 6: [shorter repairable with cut-off]+[higher, louder, longer repairing segment]
Function: recycling at the turns after disruptive actions of requesting confirmation or clarification; showing speaker's struggling getting back to the conversation

Table 6-1 Summary of sound patterns identified and the corresponding functions

After the establishment of sound patterns, the present study offered a detailed analysis to locate the functions of the recyclings, by the qualitative case-study approach. Further attempts were made to associate the sound realization with the interactional function of the recyclings identified. As shown in the discussion from Chapters 4 and 5, of the 6 sound patterns, patterns 1 to 5 share the sound feature of a longer R1. The longer R1 in patterns 1 to 5 could be resulted from a lengthened R1 (cf. pattern 3 and pattern 4), but there were also cases when the recyclings were initiated by cut-off at the end of R1 and the R1 is still the longer segment. Pattern 1 and pattern 2 both involve recyclings initiated by cut-off at the end of R1. The main difference between sound patterns 1 and 2 lies in the relative height between R1 and R2 of the recycling; for pattern 1, the almost same pitch height held between R1 and R2 reinforces the speaker's *continuation* of the discourse topic under discussion, while for pattern 2 the higher R2 signals a semantic contrast.

Patterns 3 and 4 both have a signature feature of longer R1 as the result of lengthening. The main pattern 3 has the stretched R1 accompanied by a fall-to-low ending, followed by a significant silence that could hold the turn-so-far for the function of *word* or *content* search. In contrast, pattern 4 has its R1 at a higher pitch height but without a significant silence after the initiation of the recycling. The higher R1 in pattern 4 is associated with the function of

restarting the turn after substantial production problems, such as additional examples of repair prior to the recycling. One of the crucial findings here is that, comparing to pattern 2, the two sound patterns 4 and 2 differ mainly in the relative pitch height between R1 and R2. The difference in the pitch height in turn is reflected in the distinct functions each pattern corresponds to. The higher R2 in pattern 2 reinforces the function of project *forward* a semantic contrast, while the higher R1 in pattern 4 is due to the production problem prior to the recycling, and we have to trace *backward* in the turn to locate the source of the problem that leads to the repair.

The recyclings in sound pattern 5 was found at the turns of *dispreferred actions*, such as delayed acceptance, rejection to an invitation, or disalignment. When reflected in the sound realization, it was observed that speakers tend to rush-through the R2 in the recycling, which results in a shorter R2. Given that R2 of the pattern is rather compressed in duration, there's not much room left for a great variation in the pitch contour. This explains why R2 is realized in a pitch contour that falls within the pitch range of R1. Finally, one pattern with longer R2 was identified. Pattern 6 is used in recyclings located at turns after disruptive actions such as *seeking confirmation* or *clarification*. After the recyclings are initiated by cut-offs, the higher, louder and longer R2 shows the speaker's re-establishment of the turn in progress.

In addition to the 6 main sound patterns identified, 3 additional *sub-patterns* that share some similarities with sound patterns 3 and 4 in terms of interactional function were further established. Two additional sub-patterns to pattern 3 were identified, and these two sub-patterns were found in recyclings that involved in holding the turn for content search, sometime under delicate situation. One of the sound features shared by pattern 3 and the two sub-patterns was the lengthening at the end of R1. Other optional sound features included a fall-to-low pitch contour at the end of R1, and whether there was a longer pause in between R1 and R2 or not.

One of the sound features identified to distinguish the main sound pattern from the sub-pattern was the way how the recycling was initiated, i.e. either by cut-off or by lengthening. One of such case was sub-pattern 4-1, which was separated from main pattern 4, as the recyclings in sub-pattern 4-1 were initiated by cut-offs at the end of R1. Sub-pattern 4-1 was found in recyclings located at the beginning position of second pair part, and shows the speakers' attempts getting back to the turns after the trouble with the sequential organization of the turn.

The findings described above, therefore, contribute to an interdisciplinary study that focusing on broadening the interactional linguistic theory by paying attention to the sound patterns in interaction-related devices, such as repairs. Specifically, the current study shows in detail how

the sound patterns in Mandarin conversation are employed by speakers and designed for specific interaction actions and the sequential organization of the conversation. In addition to the functions such as delaying for next item or bit of conversation due, or continuation with the turn-so-far (cf. Schriberg 1995), in our Mandarin data it is found that recycling as a method of repair also occurs in sequentially-significant location, such as the beginning of a turn that is designed for dispreferred action (cf. pattern 5), or getting back to the turn after troubles with the production of the turn prior to the recycling, such as repairs of other type (cf. pattern 4), or sequential organization such as adjacency pairs that functions to seek clarification and thus interrupts the on-going of the turn-taking (cf. pattern 6). While turning to the sound patterns corresponding to different interactional function in carrying out Mandarin recyclings, one noteworthy contribution from the current study is that, comparing to the previous studies on the prosody of Mandarin repairs (cf. Tseng, 2003; 2006), it is found that more than one sound patterns are used constantly while the speakers recycle part of the turn-so-far for the purpose of repair. By exploring the sound realizations of Mandarin recycling from an interactional linguistic perspective, the study has demonstrated how the designs of sound patterns in the process of recycling manifest the interactional function they carry.

One further point to address here with regard to the current findings is that, the patterns discussed in Chapters 4 and 5 cover 112 of the recycling examples selected and the 6 patterns presented in Table 6-1 do not describe exhaustively all the possible sound patterns that could be employed in doing recycling repairs from our corpus. As mentioned in Chapter 3 of research methodology, I considered the interactional function of the patterns in recycling examples of enough instances for the presentation of correlation between forms and consistent function. Since the data was culled from naturally occurring conversation without any controlling factor, it is expected that we would not necessarily be able to locate all the plausible interactional function associated with each possible sound pattern. Actually, there are at least 5 more sound patterns identified from the 143 recycling examples selected, in addition to the 6 patterns and 3 sub-patterns discussed in Chapter 4 and Chapter 5. But these additional patterns were found in fewer recyclings and no consistent function could be arrived at given the limited number of instances. More examples in these additional sound patterns are required in order to further identify the possible interactional functions corresponding to these patterns.

In the next section, I turn to some limitations of the current research.

6.2 Limitations and preview of further study

In the following Section 6.2.1, I first provide a list of other possible sound patterns identified but were not discussed in the current study due to insufficient recycling instances. In Section 6.2.2 the discussion focuses on one issue that was not covered in the current study, namely tone as a factor in exploring the sound patterns of Mandarin recycling repairs. In Section 6.2.3 I return to the function of *word* or *content search* found in pattern 3. As it will be suggested, in addition to the sound, an alternative mean to help us interpret the functions of the recyclings lies in the visual cues such as *gesture* or *gaze* of the interlocutors. Thus the discussion will point to a *multimodality* analysis as the direction of future study.

6.2.1 Other possible sound patterns

In addition to the 6 major sound patterns identified in Chapter 4 and Chapter 5, the following patterns were found from the 143 examples of recyclings in our corpus:

- [higher R1 with cut-off] + [longer R2]
- [longer, higher R1] + [significant pause]+ [shorter R2]
- [longer R1]+[significant pause]+[R2 at the same pitch height]
- [R1 with cut-off]+[significant pause]+[longer, higher R2]
- [Shorter R1]+[R2 at the same pitch height]

As suggested earlier, further data will be needed in order to clarify the status of these additional sound patterns and possible functions correlated to each. With additional data, it also helps to verify if these additional sound patterns might be established as individual pattern or as possible sub-patterns to the 6 main patterns identified.

6.2.2 Recyclings in a tone language

One aspect that was not covered in the current study is the question about if tones play a role in Mandarin recycling and the sound patterns identified in doing the recyclings. An attempt that has been made to exclude tone as a factor in carrying out recyclings was to examine the recyclings categorized under a sound pattern and to check if these examples in one pattern cover recyclings of words in 4 different tones. In the actual execution, though it is found that most of the sound patterns discussed in Chapters 4 and 5 were found in recyclings that involve 4 different tones, not all the sound patterns were found to be involved in recyclings of all 4 different tones. This may be due to that some of the patterns identified cover only a few recycling instances from our recycling corpus. Moreover, as it has been shown, sometimes the recyclings in a sound pattern may involve repetitions of, for example, specific function words such as personal pronouns. As result, the recyclings cover a limited selection of words or phrases. In the end, for some of the patterns there were not enough examples to show that the recyclings in these

patterns happened to involve repetitions of words or phrases in 4 different tones.

Another question related to tone and recycling is if there was any recycling that was done by replacing R1 with R2 of the same word or phrase but in a different tone, namely tone repair, or tone-choice repair (cf. Tao et al. 1999). Indeed, tone could serve as a factor for the speaker to recycle part of the turn-so-far. The recycling in (1) is one of the tone-choice recyclings found in the current recycling corpus:

(1) CA-02-Sgr-027

1.	H:	·hhh	dengyixia-	suoyi	ni	de	yisi	shi	shuo	ta-		
			wait	so	2sg	Poss	meaning	CP	say	3sg		
2.		(0.3)	yi::	dan::	shen::qing::		ta::	yiding	duoshi	shenqing		
			once		apply		3sg	must	all	apply		
3.		PHD	MEIyou	ren	zhi	na	shuoshi:::					
		PhD	Neg-have	people	only	take	master					
4.	C:	meiyou	meiyou									
		Neg-have	Neg-have									
5.	H:	zhishi-	you	keneng	shuo	okay	ni	yexu::	(.4)	yexu	(.4)	
		only-CP	have	possible	say	okay	2sg	perhaps		perhaps		
→ 6.		shenqingdao	le	ranghou	ni::	ni-	**nian33**	**le-**	**nian53**	**le**	yi liang:	
		get accepted-RC	Asp	then	2sg	2sg	study	Asp	study	Asp	one-two	
7.		yi liang	nian	ranhou	ni-	(0.3)	xiangyao	jiushi		shuo:::		
		one-two	year	then	2sg		want	precisely-CP		say		
8.		(.6)										
9.	H:	huan	paodao:::									
		change	track									

H: ‘·hhh wait- so what you mean is that he- (.3) once:: (he) applied:: (it) has to be Ph.D. NO one applies only for masters:::.’
C: ‘No no.’

H: ‘(It’s) only- there’s a possibility that, okay, you perhaps:: (.4) perhaps (.4) got accepted and you:: you- **studied- studied** for one or two: one or two years and you- (.3) want to that is:::’
(0.6)
H: ‘change the field:::’

The recycling in line 6 is done on a verb plus the aspectual marker *nian le* ‘studied’. When standing alone, the verb *nian* ‘to study’ is in high falling citation tone (marked by the number “51” for pitch register, cf. Chao 1968) and the aspectual marker *le* is in neutral tone[1]. In doing the recycling, however, the R1 is actually realized with a level pitch contour, and when the speaker moves on to R2, she redoes the tone by starting the R2 at a higher pitch then with a falling contour throughout to the end of the aspectual marker *le*, as presented in the following Figure 6-1:

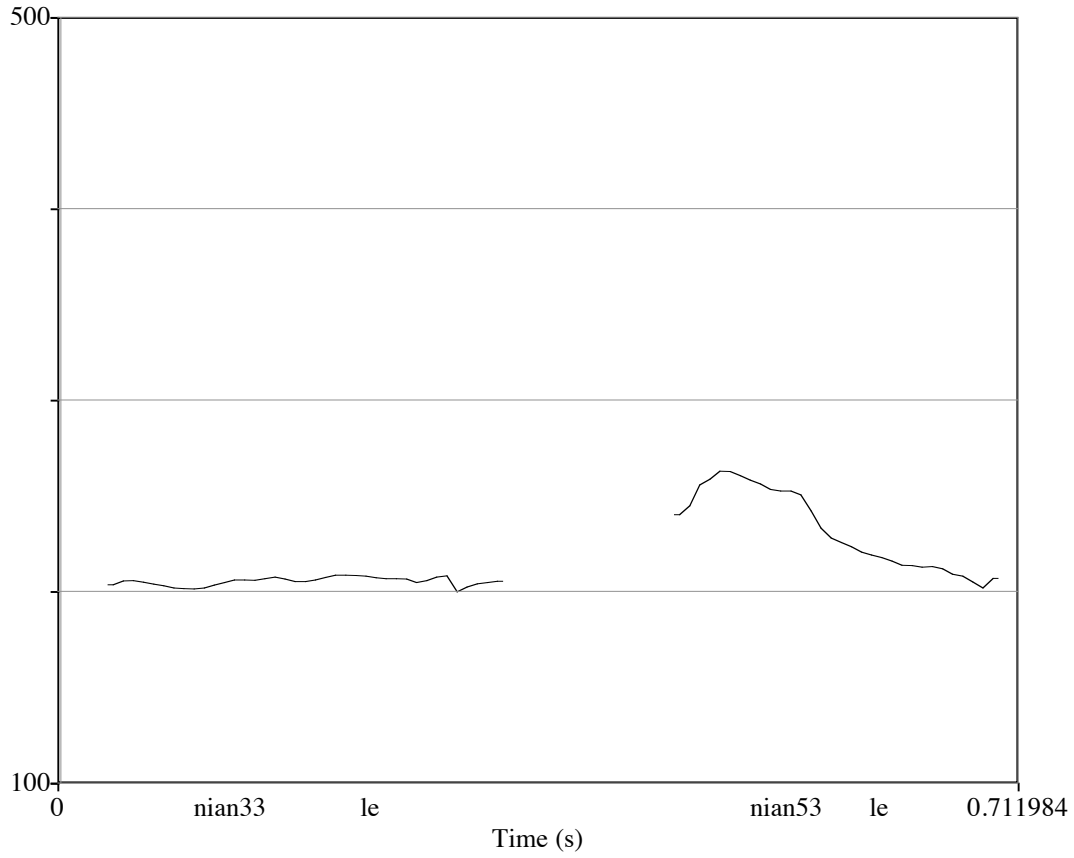

Figure 6-1 Fundamental Frequency for recycling in Ex (1)

In this case, the R2 in a falling tone manifests a replacement of the R1, which should be in a high-falling tone but is produced as almost a level tone. I was able to locate at least 5 instances of recyclings that could be identified as such tone-choice repair from the recycling corpus. However, given that tone repair is not the central focus of the current study, also there lacks a precise working definition for tone repair, the discussion of tone-choice recycling is beyond the scope of current discussion.

Still, one more point to address, possibly also related to tone and recycling, is that there are 6 recyclings identified with a special tone/pitch contour manifestation. One of the recyclings is presented in (2) below:

(2) Ca-05-Sgr002

1.	H:	> ta	yao<	qu	duojiu	a							
		3sg	Aux	go	how long	Q							
2.	C:	liang nian											
		two year											
3.		(.9)											
4.	H:	( )											
5.	C:	> wo	juede	zhe shi<	yige-								
		1sg	feel	this CP	one-CL								
6.		(.6)											
→ 7.	C:	>wo	bu	xiaode	wo<	wo	women	**zai-**	(.)>	**zai**	taiwan	de	shihou<
		1sg	Neg	know	1sg	1sg	1pl	Prep		Prep	PN	Nom	time
8.		ni	genben	conglai	meiyou	xiangguo	>you			ge	zheyang<	de	
		2sg	at all	ever	Neg-have	think	have			CL	as this	Nom	
9.		jihui	huo	keneng									
		chance	or	possibility									

H: 'How long will she go?'
C: 'two years.'
(.9)
H: '( )'
C: '>I think this is< a-'
(.6)
C: '>I don't know, I< I when we were **in-** (.) >**in** Taiwan< you haven't ever thought about there could be such a chance or possibility.'

In (2), the speaker recycles a preposition *zai* that occurs after she has produced quite a bit of the turn. Note that the word *zai* usually is pronounced with a high-falling citation tone when standing alone. The pitch contour of the recycling is presented in Figure 6-2:

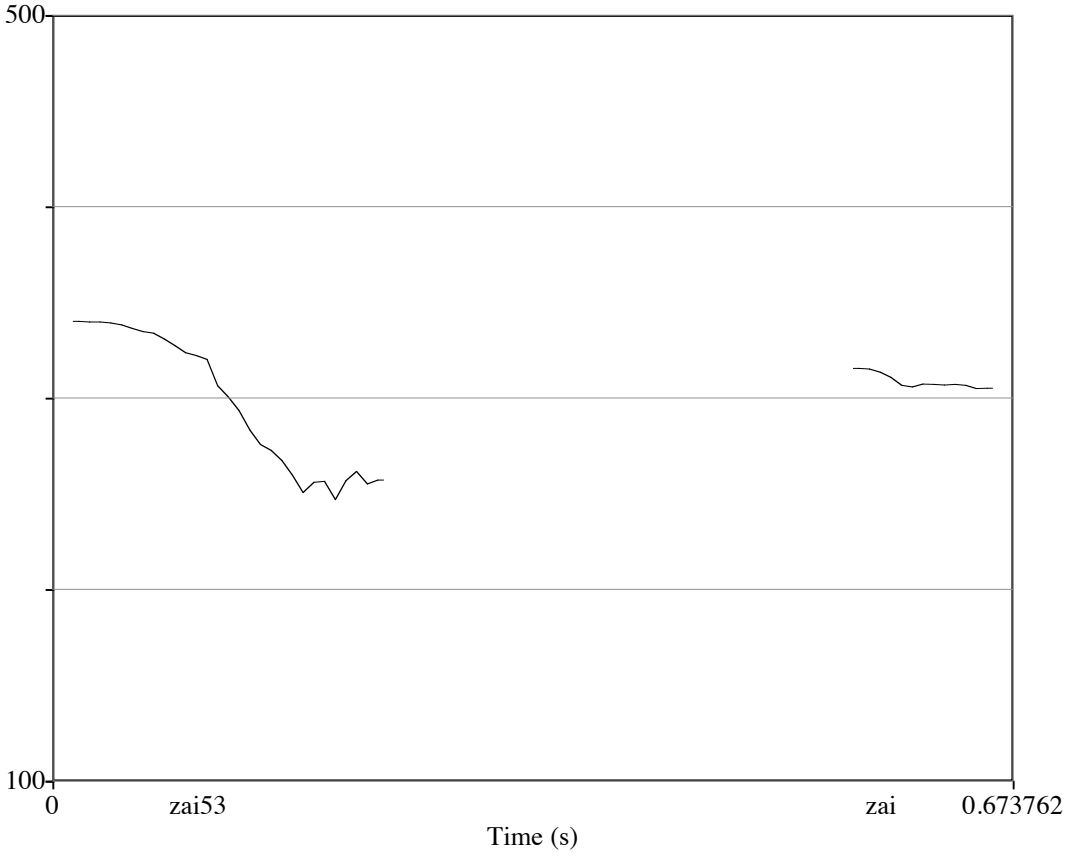

Figure 6-2 Fundamental frequency for recycling in Ex (2)

As can be seen, the R1 in the recycling is realized in a high falling pitch contour, which matches the original tone. The R2, however, only has a slight falling at the beginning of the word, then turns to a level contour. Interestingly, the other 5 recyclings all involve words in a high falling citation tone and have the R1 in a high-falling pitch contour, but R2 in an almost level contour. Obviously this is not the same case as the tone-choice recycling described in (1). To our knowledge, neither has this high-falling tone changing into a level tone been described as a

tone-sandhi rule in the language. Yet there hasn't been any reasonable explanation provided to account for why there would be such a shift in tone realization of R1 and R2 in these recyclings.

6.2.3 Sound patterns and visual cues in recyclings: toward a multimodality analysis

As discussed in Chapter 4, one of the sound patterns was found to be correlated with the interactional function of *word* or *content* search, namely pattern 3 of the sound format **[longer R1 with lengthening and a fall-to-low ending]+[significant silence]+[R2 at higher pitch height]**. The finding showed that, the lowering in a lengthened R1 followed by significant pause functions specifically for the action of doing word or content search. To further the analysis, it is suggested that additional attentions can be drawn on if there is any *visual conduct* accompanying the action of word/content search, such as aversions of gaze or other manual and facial gestures (cf. Goodwin and Goodwin 1986). In the study by Goodwin and Goodwin (1986), it is shown that during the action of *word search* in American English conversation, a word search speakers frequently gaze away from their recipients, accompanied by additional facial gestures such as a "thinking face" (Goodwin and Goodwin 1986). In the same vein Hayashi shows that in Japanese conversation word searches can be initiated by the vocal cues such as sound stretches, word cut-offs or intra-turn pauses on some delaying devices or self-addressed questions for recollection, as well as non-vocal gestures including aversions of

gaze away from the recipients and a variety of manual and facial gestures (2003: 150).

It is proposed, therefore, in order to further the current research, the next step is to resort to a *multimodality* analysis that pays attention to at the same time the sound realizations and the visual presentations for the interactional actions in conversation. As Goodwin and Goodwin suggest, gestures in particular events are "meaningful as a constitutive feature of the social organization of the activities speakers engaged in" (1986: 51). The eventual goal is to turn to a *multimodality* analysis that encompasses, not only the word or grammatical structures involve in the repair, but also the sound and gesture that also constitute and contribute to the production and comprehending of interaction. An exploration of the multimodality analysis may also help to explain the "ambiguous" cases such as the recycling in (31) of chapter 4 that involves the repetition of the Mandarin demonstrative *nage* for possibly various functions.

6.3 Directions for future research

The current study provided an exploratory examination of sound patterns in Mandarin recyclings and the correlation between sound and talke-in-interaction. Several directions for future research are thus opened by the preliminary exploration as result from the current work. Most of all, the present study offers convincing evidences to show how speakers in natural

conversation employ the sound or prosodic cues that form patterns for particular interactional functions. As this study concentrates on recyclings as one of the crucial devices for interaction, I hope that such a study by the approach of *interactional prosody* sheds light on further exploration of the sound realization of talk-in-interaction, focusing on different interactionally-related devices, in order to uncover further how the sound is designed specifically for carrying out interaction and sequential organization of talk-in-interaction.

Moreover, with respect to the methodology adopted in the current study, the following are some possible directions for further exploration:

- With regard to the methodology for acoustic measurements, in the present study I took an *impressionistic* approach in conjunction with actual acoustic measurement (by using Praat) when describing the acoustic features in formatting the sound patterns. It has been acknowledged in Section 3.2 that the prosodic features under discussions in the current study had been approached differently in terms of the proportion an impressionistic judgment being involved: for features such as *cut-off* and *lengthening*, the judgment of their presence was made mostly impressionistically. On the other hand, I also relied on the acoustic measurements for the prosodic cues such as *pitch*

height, *duration*, and *silence*, to decide the relative sound presentation of these cues between R1 and R2 of the recyclings. As result, a question has been raised concerning if the acoustic measurement could faithfully reflect an impressionistic judgment, i.e. the duration difference between R1 and R2 of sound pattern 6 discussed in Chapter 5. It has been pointed out is Section 5.1.4 that a statistical analysis of *T-test* has shown the difference in duration between R1 and R2 in the recyclings was significant. But there might be other approaches that could be incorporated to make further distinction or define the measurement of duration as part of the sound realization of the repair (cf. Plauché and Shriberg 1999).

- Furthermore, although in Section 3.2 on methodology for acoustic measurements it included the measurement of loudness, there was no conclusive analysis as for how the sound cue of loudness worked in the sound patterns reported in this study, except for pattern 6. Further data and acoustic analysis may help to resolve the question concerning how loudness interacts with other sound cues in contributing to the interpretation of talk-in-interaction.
- From the discussion of the correlation between sound patterns in recyclings and their interactional function, there are other prosodic cues that seemed to also play a role in contributing to aspects of interaction while doing the recycling but hasn't been

discussed systematically, i.e. speech rate. Moreover, another factor that might contribute to the discussion of interactional function of the recyclings is the location of the recycling within a turn. Although it has been implicitly discussed throughout the findings that the sound feature such as speech rate or the factor such as location of the recycling may be crucial to the discussion of the interactional functions corresponding to the recycling, there hasn't been an in-depth discussion on either feature. A more systematic and detailed study can concentrate on both features.

- Along the same vein, in addition to the aforementioned acoustic cues, there are other sound features that were not considered here, i.e. vowel quality, pitch accent and prominence (in relation to the relative pitch height between R1 and R2 of the recycling), and co-articulation, i.e. speech rate in relation to co-articulation. Once again, as mentioned in Chapter 3 on methodology, I chose to focus on certain acoustic cues in formatting the sound patterns for Mandarin recyclings, but this does not imply these sound cues are the only features to consider when discussing the relationship between sound and interactional function. It will be worthwhile to explore how other acoustic features also contribute to the interpretation of interaction and organization of the naturally occurred conversation.

- As suggested in Section 6.1, there were sound patterns identified but only with limited number of recycling instances. Additional data will be required to validate the possible interactional function corresponding to these patterns, or further identify if these patterns might be in relationship with the sound patterns already established in the current study.
- It is mentioned in Section 6.2, that the factor of tone in Mandarin repair still remains to be further explored.

The following points summarize some directions for further research as result of the general discussion derived from the current study:

- This study serves as an exploratory research to the sound patterns in Mandarin recycling repair and the correlation between the sound realization and interactional function. So far the description of sound patterns as *form* in relation to the interactional function has been provided as a one-to-one mapping. As suggested, I do not intend for the present study to imply that the mapping between sound patterns as forms and their function is an absolute one-to-one mapping relationship. Most of all, due to that each sound pattern under discussion here was described as constellations of

selected prosodic cues, it is possible that the interactional function identified could be associated with one of the sound feature in forming the sound pattern. Since some of the sound patterns identified shared the same acoustic features, as the result, some of the interactional functions could seem to be in overlapping. One of the future directions for future study, therefore, would be to examine if each of the acoustic cues could be associated with a specific interactional function.

- In the discussion of Section 6.2 above, it has been suggested that one of the directions of future research is to take a *multimodality* approach to the repair as an interactional action in natural conversation. As mentioned, some previous studies by Goodwin and Goodwin (1986) and Hayashi (2003) have found non-vocal gestures accompany the action of *word search* in American English and Japanese conversation respectively. Since one of the major functions of repair in conversation is to delay the turn-so-far for word or content search, it will be valuable to explore how the verbal cue such as sound patterns and non-verbal cues such as gestures work together at the same time to contribute to the interpretation of actions in conversation. Further exploration could be made as for if other specific interactional actions in conversation can be associated with certain sound patterns that are also paired with non-verbal gestures.

- Following the previous point, while the current study points to the direction of a *multimodality* approach to repair as an interactional action, this suggests that both sound realization and non-verbal cues contribute at the same time to the interpretation of action in interaction. Actually, as mentioned in the Introduction chapter, although the current study focuses on the correlation between sound patterns and recyclings in interaction, it is recognized that sound realization is one of the many factors contribute to the interpretation of talk-in-interaction. The meaning of words or phrases involved in the action, or the contextual information together with sound and gesture all play crucial roles in a multimodality approach to talk-in-interaction. Further study can be carried out to concentrate on how each of these various factors interacts in contributing simultaneously to the production and comprehension of talk-in-interaction.

Last, but not the least, recycling as a method of repair is a complicated phenomenon in conversation. Though when presenting in the text, it involves only simple repetition of words or phrases, our study has further demonstrated that recyclings actually involve various sound realizations for different interactional purposes. If we were to take the recycling merely as a kind of disfluency and dismiss the repetitions due to their redundant nature, i.e. in the "self-correction" parser proposed by Hindle, one of the rules implemented is to expunge part of

the repetition and take the self-correction as "having extra material inserted" (1983: 125), obviously it would also eliminate much additional information that the recycling may tell us about the on going conversation. With the findings from the present study, it may enlighten the studies from the psycholinguistic or language processing (especially speech processing) perspectives to take into further consideration the more than one possible sound realizations of disfluency and the possible interactional and pragmatic functions when examining the phenomenon.

In addition to the field of psycholinguistic and natural language processing, our findings may shed light on studies of second language acquisition. Specifically, as a study that pays attention to sound cues including pitch, silence, and duration and possible interactional function associated with these sound cues, it also reminds us that these sound cues may play an important role in second language instruction, such as teaching pronunciation. Actually, there has been study discussing how the research on conversational prosody can inform teaching methodology of English pronunciation (cf. Szczepek Reed 2010). By introducing this new methodology and its applications to pedagogy, the eventual goal is to enhance the alignment of between sound patterns and interactional strategies in the language instruction.

[1] In Mandarin, one of the methods used to represent four tones is by using numbers to indicate pitch register, according to a scale of five levels, with 5 being the highest and 1 the lowest (Chao, 1968; Li and Thompson, 1981):

First:	55	High level
Second:	35	High rising
Third:	214	Falling-rising
Fourth:	51	High falling

Note that for the *Pinyin* system, a syllable with a neutral tone receives no diacritic mark.

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Appendix A: Notation conventions in the transcription

The following transcription conventions are adapted from Sacks et al. (1974) and Ochs et al. (1996), which are based on those introduced and developed by Gail Jefferson. The conventions described below follow mostly Ochs et al. (1996), with additional notations incorporated to indicate two types of cut-offs, following Jasperson (1998, 2002).

I. Temporal and sequential relationships

[**A** Indicates a point of overlap onset, whether at the start of an utterance or later.

] **B** Indicates a point at which two overlapping utterances end.

[[**C** Double left square brackets are used alternatively with single ones, when two overlapped turns occurred consecutively one after the other.

= **D** Indicates the following utterance 'latches' on to the prior utterance without discernable silence between the two utterances by two speakers. Also used when the two utterances are produced by the same speaker.

(0.N) **E** N in parentheses indicates silence, reported in tenths of a second. Silences may be marked either within an utterance or between utterances.

(.) **F** A dot in parentheses indicates a hearable 'micropause'. A cut-off point of 0.2-second applies. Any silence under 2/10 of a second is reported by using this notation.

II. Aspects of speech delivery and intonation

< **A** The "less than" symbol by itself indicates that the immediately following talk is

> < "jump-started" from the syllable prior to the symbol. It sounds like starting with a rush. The comination of "more than" and "less than" symbols indicates that the talk in between is compressed or being rushed through.

WORD **B** Indicates relatively loud speech.

° **C** The degree sign indicates that the talk following it was relatively quiet or soft.

° ° When there are two degree signs, the talk surrounded by the signs is relatively quiet or soft.

: **D** Indicates lengthened syllables. Multiple colons indicate longer lengthening in the syllables

↓ **E** The up and down arrows mark discernable rises or falls in pitch change.

↑

hh **F** Indicates hearable aspiration that occurs in the talk. The aspiration may also

˙hh represent laughter. If the aspiration is an inhalation, it is shown with a dot before it

˙HH (usually a raised dot). The upper case H is incorporated to indicate strong aspiration.

<u>w</u>ord **G** Underlining in words indicates some form of stress or emphasis, either by increased

WORD loudness or higher pitch. Especially loud talk may be indicated by upper case.

- **H** The dash indicates a "soft" cut-off that have either unnoticeable or a glottalization without interruption.

% **I** The percent sign marks "glottalized" cut-offs that have salient interruption glottalization.

III. Others

( ) **A** Empty parentheses indicate that something is being said, but the content of the talk is not clear and thus no transcription could be achieved.

(( )) **B** Double parentheses are incorporated to mark transcribers' descriptions of additional actions or events, rather than representations of them.

(letter) **C** When a letter is in parentheses, it indicates omissions of the initial or final sound corresponding to the letter in standard Hanyu Pinyin, which reflects uncertainty on the transcribers' part, but represents a likely possibility.

Appendix B: List of Abbreviations

In this appendix a list of abbreviations for glossing the Mandarin data is provided.

1pl	1st person plural
1sg	1st person singular
2sg	2nd person singular
3pl	3rd person plural
3sg	3rd person singular
Adv	Adverb
Asp	Aspectual marker
Aux	Auxiliary
CL	Classifier
Conj	Conjunction
CP	Copular
DC	Directional complement
Ex	Exclamation
Exp	Experiential marker (i.e. *guo*)
FP	Final particle
Neg	Negation
Nom	Nominalization
Part	Particle
PF	Pause filler

PN	Proper name
Poss	Possessive
Prep	Preposition
Q	Question marker
RC	Resultative complement